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FOREST BIOLOGY RANGER ANNUAL REPORTS
ALBERTA
1959

INTERIM REPORT 1959-2
FOREST BIOLOGY LABORATORY
CALGARY, ALBERTA

CANADA DEPARTMENT OF AGRICULTURE
RESEARCH BRANCH
FOREST BIOLOGY DIVISION
MARCH 1960

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FOREST BIOLOGY RANGER REPORTS

ALBERTA

(Forest Insect and Disease Survey No. 30.01-6)

by

J.K. Robins, K. Andrews, P.F. LaRue, J. Petty,

V.B. Patterson, N.W. Wilkinson, F.J. Emond,

R.R. Stanley, G.C. Bigalow.

INTERIM REPORT 1959

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

(Based on investigations carried out in 1959)

CANADA

DEPARTMENT OF AGRICULTURE

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FOREST BIOLOGY DIVISION

March, 1960

(This report may not be published in whole or in part without the written consent of the Chief, Forest Biology Division, Research Branch, Department of Agriculture, Ottawa, Canada.)

INTRODUCTION

The annual survey of forest insect and disease conditions in Alberta, Yoho and Kootenay National Parks and the Mackenzie District of the Northwest Territories was conducted between May 4 and September 30, 1959 by a field staff of 8 Forest Biology Rangers from the Forest Biology Division of the Federal Department of Agriculture in Calgary. In the conduct of field reconnaissance, quantitative surveys and related duties, Rangers travelled approximately 100,000 miles by motor vehicle, 8400 miles by chartered aircraft, 1800 miles by commercial airlines and 900 miles by boat. Samples of forest insects and tree diseases collected during the season amounted to 1616 and 124 respectively.

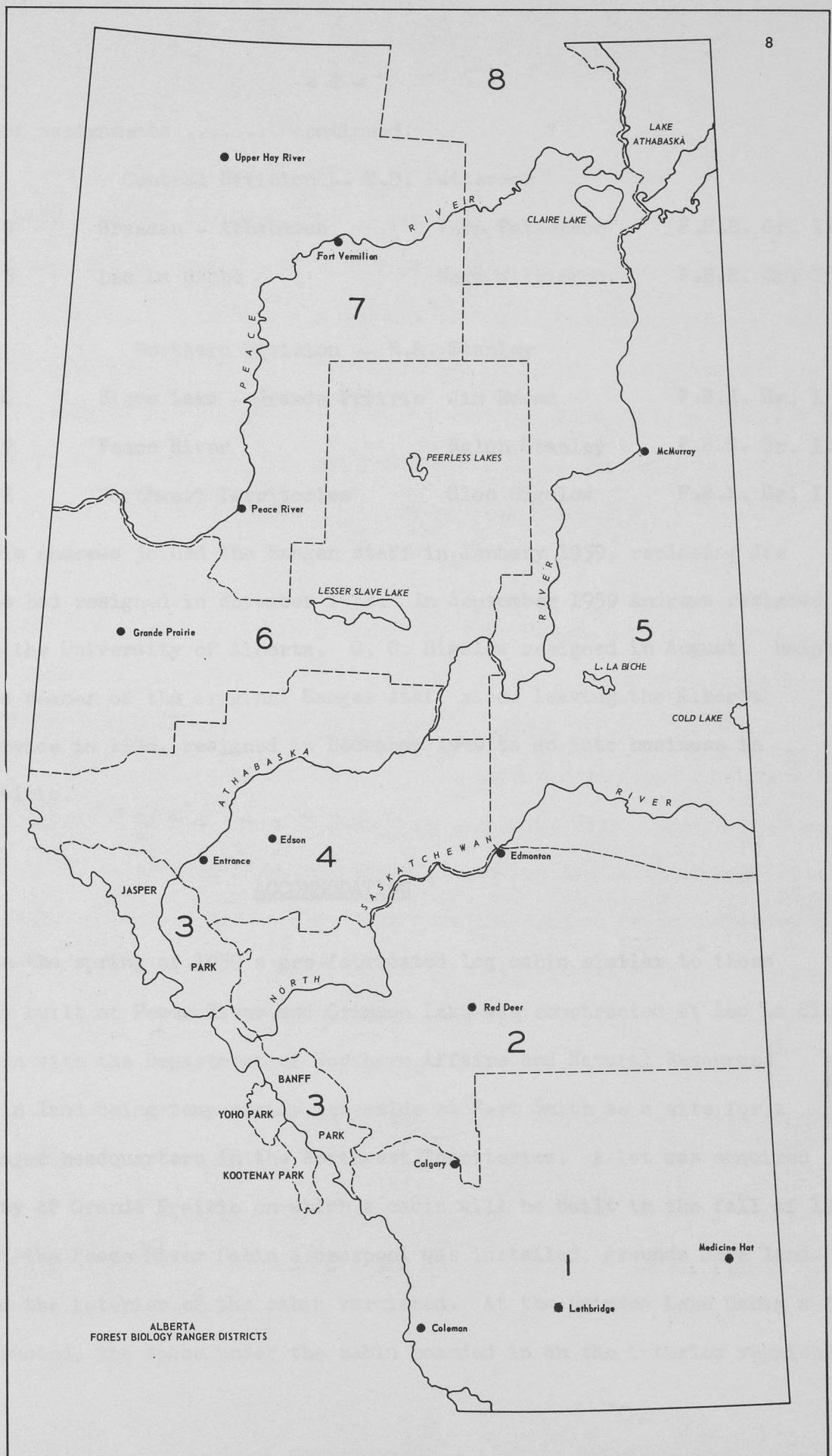
The continued assistance given to field personnel by the Alberta Forest Service, the Provincial Agricultural Extension Service, and the Department of Northern Affairs and Natural Resources was greatly appreciated.

FIELD STAFF ASSIGNMENTS

A number of changes in district boundaries and staff assignments were effected prior to the 1959 field season. The northern boundaries of Districts 1 and 2 were shifted northward in the agricultural portion of the districts in order to cut down the size of District 5. District assignment and divisional responsibilities were as follows:

Southern Division -- J. Petty

District 1	Crowsnest - Bow River	Kim Andrews	F.B.R. Gr. I
District 2	Clearwater	Paul LaRue	F.B.R. Gr. I
District 3	National Parks	Jack Petty	F.B.R. Gr. II



Field staff assignments continued.

Central Division -- V.B. Patterson

District 4	Brazeau - Athabasca	Vern Patterson	F.B.R. Gr. II
District 5	Lac La Biche	Norm Wilkinson	F.B.R. Gr. I

Northern Division -- R.R. Stanley

District 6	Slave Lake - Grande Prairie	Jim Emond	F.B.R. Gr. I
District 7	Peace River	Ralph Stanley	F.B.R. Gr. II
District 8	Northwest Territories	Glen Bigalow	F.B.R. Gr. I

Kim Andrews joined the Ranger staff in January 1959, replacing Joe McNeil who had resigned in November 1958. In September 1959 Andrews resigned to attend the University of Alberta. G. C. Bigalow resigned in August. Ralph Stanley, a member of the original Ranger staff since leaving the Alberta Forest Service in 1948, resigned in December 1949 to go into business in Grande Prairie.

ACCOMMODATION

In the spring of 1959 a pre-fabricated log cabin similar to those previously built at Peace River and Crimson Lake was constructed at Lac La Biche. Negotiation with the Department of Northern Affairs and Natural Resources resulted in land being temporarily set aside at Fort Smith as a site for a future Ranger headquarters in the Northwest Territories. A lot was acquired in the city of Grande Prairie on which a cabin will be built in the fall of 1960.

At the Peace River Cabin a cesspool was installed, grounds were landscaped and the interior of the cabin varnished. At the Crimson Lake Cabin a fence was constructed, the space under the cabin boarded in and the interior varnished.

TRANSPORTATION

Motor vehicles used by Forest Biology Rangers in 1959 consisted of one sedan delivery, 2 half ton panels and 5 winch equipped one ton panels. The out-board cruiser "Borealis" and a 17 foot freighter canoe furnished water transportation in northern districts. A new one ton panel was purchased for the Northwest Territories District, a three-quarter ton panel to replace the one ton panel for the Peace River District and a half ton panel to replace the half ton panel used in the Crowsnest - Bow River District. A custom built boat trailer replaced the worn out trailer used to transport the "Borealis".

AERIAL SURVEYS

The use of aircraft in the detection and mapping of forest insect outbreaks increased threefold in 1959. A total of 55.5 hours were flown by Forest Biology Rangers compared to 17.5 hours in 1958.

The survey of aspen defoliation in central and southern Alberta was substantially aided by 4 flights in late June and early July. Spruce budworm outbreaks on the Mackenzie, Liard and Slave rivers and the larch sawfly infestations south and west of Great Slave Lake were the subject of an extensive aerial survey in mid-August. The funds for this survey were supplied by the Department of Northern Affairs and Natural Resources. A flight was taken at the end of August to assist in the mapping of the larch sawfly outbreak in Northwestern Alberta and to check for spruce budworm damage on the site of an old outbreak on the Wabiskaw River.

SPECIAL SURVEYS AND PROJECTS

In addition to general ground and aerial detection and appraisal surveys, field personnel participated in the following special surveys, sub-projects and co-operative projects:

(1) Sequential sampling methods were employed at 29 sampling stations previously established throughout the accessible portions of the present larch sawfly outbreak.

(2) A modified form of the New York State Science Service tent caterpillar sampling method was used at 48 locations in Districts 2, 5, 6 and 7. The accuracy of defoliation forecasts based on this survey will be determined by damage appraisals to be made in 1960.

(3) The project carried out during the spring of 1957 and of 1958 at Elk Point to study the effect of weather on tent caterpillar larval mortality during the critical hatching period was moved to Lac La Biche in 1959. Egg bands and early instar larvae were kept under observation and weather records were taken from late April until early June.

(4) The use of spruce as an indicator species in the Phenology studies began in 1958 was discontinued in favor of pine because of difficulties in obtaining accurate and comparative measurements. Stations were established at 19 locations throughout the forested areas of the Province.

(5) Spruce budworm development was studied at a temporary field station near Fort Norman between June 7 and August 5. Data obtained from larval rearing, field observations and weather records are to be used to establish the life history and rate of development of the spruce budworm at northern latitudes.

(6) Spruce seed plots established by the Federal Forestry Branch in central and southern Alberta were again examined and the 1959 cone crop estimated.

(7) Special collections of Adelgids, leaf rollers and Bruce spanworms were made in connection with survey sub-projects.

(8) Mass collections of spruce budworms, forest tent caterpillars, yellow-headed spruce sawflies, Bruce spanworms, and balsam-fir sawflies were made for subsequent parasite rearings.

(9) Special attention was given to collections of the following: Pitch nodule makers, Hyalophora spp., Pissodes spp., wood borers, bark inhabiting insects, Chrysomelidae, larch shoot moths, needle miner other than R. starki Free., larvae of the 1-year and 2-year life cycle spruce budworm, blotch miners, Cecidomiidae in spruce buds, diseased insects and others.

(10) Field personnel co-operated with research workers in other laboratories through collections of special material. These included ugly-nest caterpillars, Pamphiliid larvae, aphids, Chilocorus sp., Neodiprion sp., larch shoot moths and leaders from lodgepole pine. Forest tent caterpillar hatching dates were recorded for research workers at the University of Minnesota.

SUMMARY OF INSECT CONDITIONS

Larch sawfly, Pristiphora erichsonii (Htg.)

Aerial surveys carried out in 1959 filled in the last large gap in the known distribution of the larch sawfly in Alberta and the Mackenzie District of the Northwest Territories. In the past 2 summers infestations of varying intensities have been found over most of the range of tamarack south of Great Slave Lake.

Since the current outbreak reached severe proportions around Cold Lake in 1953 the center of the infestation has been moving westward and northward and in 1959 extended in a band from Sundre through Rocky Mountain House, Stony Plain, Fawcett, and Wabiskaw Lakes into northeastern Alberta. In the wake of this movement, larch sawfly populations have decreased to medium or light in

areas previously heavily infested. In northwestern Alberta populations are on the increase although still in light to medium categories.

The most severe damage occurred between Sundre and Alder Flats in southern Alberta, from Fawcett to Wabiskaw Lakes in central Alberta and along the Saskatchewan Border from the Clearwater River to the Northwest Territories Boundary in northeastern Alberta. In the Northwest Territories the heaviest infestation lay between the Slave River and the Hay River from the Boundary to the south shore of Great Slave Lake.

Forest tent caterpillar, Malacosoma disstria Hbn.

Severe defoliation of aspen by the forest tent caterpillar occurred in 2 large and several small areas in 1959. Near Elk Point an infestation first observed in 1957 has spread to about 600 square miles, bounded by Hoselaw, St. Edouard, Morecambe, Chailey, Gratz and Elk Point. Southeast of Grande Prairie aspen stands covering 1,450 square miles were severely defoliated. Small patches of severe defoliation occurred near Marie and Cold lakes, south of Fawcett Lake, within a 40 mile radius of Nampa, and south of Fort Vermilion.

Light to medium damage occurred in a broad band running diagonally across Alberta from Lloydminster to the Clear Hills. In southern Alberta light infestations occurred at Medicine Hat, Lethbridge, near Beaver Mines, in Waterton Lakes National Park and in the Cypress Hills.

Spruce budworm, Choristoneura fumiferana (Clem.)

The spruce budworm outbreak in the Mackenzie River Valley declined in 1959. Although larvae could be found in many spruce stands along the river, damage could not be observed from the air except at Camsel Bend, 10 miles south of Wrigley and in an area adjacent to Fort Simpson where moderate damage occurred.

A marked increase in the activity of the spruce budworm was evident on the Liard River where moderate to heavy defoliation occurred from Fort Liard to within 6 miles of the British Columbia Boundary and up the Petiot and Kateneelnee rivers. Downstream from Fort Liard light to moderate damage was observed at intervals along the Liard River to Fort Simpson.

Along the Slave River, the spruce budworm outbreak extended for 90 miles, from 10 miles north of Salt River to 15 miles south of Long Island. Light to medium populations were found in the southern portion of the outbreak area with medium to heavy populations in the northern part.

The outbreak in the Cypress Hills along Battle and Grayburn creeks decreased in intensity but occupied the same area as in 1958. Moderate damage to the current years foliage occurred.

First-year larvae of the 2-year-cycle spruce budworm in the National Parks did little damage in 1959. Moderate damage to new growth may occur in some parts of Yoho National Park in 1960.

Leaf rollers on aspen

The complex of leaf rollers that has been active in Alberta for the past 4 years continued to cause damage to aspen stands in many parts of the Province. The insect species involved included Pseudexentera improbana oregonana Wlshm. which constituted about 90% of the larvae collected, Choristoneura conflictana (Wlk.) which accounted for about 6% of the larvae and Compsolechia niveopulvella (Chamb.) found in small numbers only.

The most severe damage occurred to scattered aspen bluffs within a hundred mile radius of Edmonton where complete defoliation was a frequent occurrence. Moderate to severe defoliation occurred in the Peace River Block around Clear Prairie, Woking and Sexsmith and from Camrose to the Saskatchewan

Border. Patches of light and occasionally moderate defoliation occurred throughout the remainder of the aspen zone.

Bruce spanworm, Operophtera bruceata (Hulst.)

Defoliation of aspen by this insect was prevalent from the Porcupine Hills to Edmonton and east to the Saskatchewan Border. Damage was predominantly in the light to moderate category interspersed with patches of heavy defoliation. Light damage occurred in the Hinton-Obed-Marlboro area where high populations have persisted for 4 years.

In the foothills region south and west of Calgary, a westward shift of populations was evident. South of the Bow River there was a decrease in numbers with a corresponding increase north of the Bow.

OTHER NOTEWORTHY INSECTS

<u>INSECT SPECIES</u>	<u>REMARKS</u>
Alder leaf miner, <u>Gracilariidae</u>	Mined 60 - 80 per cent of alder leaves along Pembina River near Evansburg. Moderate injury along streams in the Grande Prairie and Slave Lake Forest Divisions.
Aspen leaf miner, <u>Phyllocnistis populiella</u> Chamb.	Wide distribution in western Alberta in 1959. Heavy west of Jasper and south of Field. Moderate at Rock Lake, Hinton, Marlboro, Edson, south of Grande Prairie and at Mile 281, on Mackenzie Highway.
Black-headed budworm, <u>Acleris variana</u> (Ferm.)	Caused little damage in 1959. Light damage in Cascade Valley and along Jim Coon Creek in Banff Park.
Douglas-fir beetle, <u>Dendroctonus pseudotsugae</u> Hopk.	124,500 fbm. fir timber destroyed in Porcupine Hills, 94 per cent during last 3 years.

Other noteworthy insects.....continued

INSECT SPECIES	REMARKS
Engelmann spruce weevil, <u>Pissodes engelmanni</u> Hopk.	Infestation at Kootenay Crossing active. Light infestations at Ottertail Creek in Yoho Park, at Rock Lake and north of Calling Lake.
Fall cankerworm, <u>Alsophila pometaria</u> (Harr.)	Infestation comparable to 1958. Infested shelterbelts south of Highway 9 and west of Highway 2.
Lodgepole needle miner, <u>Recurvaria starki</u> Free.	Very low populations persist at Black and Hawk creeks in Kootenay Park and at Mt. Girouard, Massive Mountain and Mt. Eisenhower in Banff Park.
Pine needle scale, <u>Phenacaspis pinifoliae</u> (Fitch)	The infestation along the York Creek Road south of Coleman has subsided. Populations light in 1959.
Poplar scale, <u>Aspidiotus popularum</u> (Marlatt)	First report of poplar scale by Forest Insect Survey in Alberta. Small infestations near Warspite and Andrew.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	Little damage reported in 1959 in contrast to previous years when damage was widespread and often serious.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	Infestations markedly reduced over most of Province. Medium to heavy populations were found in the Penhold-Stettler-Camrose-Ponoka area.

TREE DISEASES

As in previous years, disease conditions of outbreak proportions were reported on "Forest Disease Outbreak Sheets" and outbreaks previously reported were re-examined on a predetermined schedule. Special emphasis was placed on collections of stem rusts in the genus Cronartium and in filling gaps in the known distribution of other diseases including dwarf mistletoe, Atropellis canker of pine and Hypoxyylon canker of poplars.

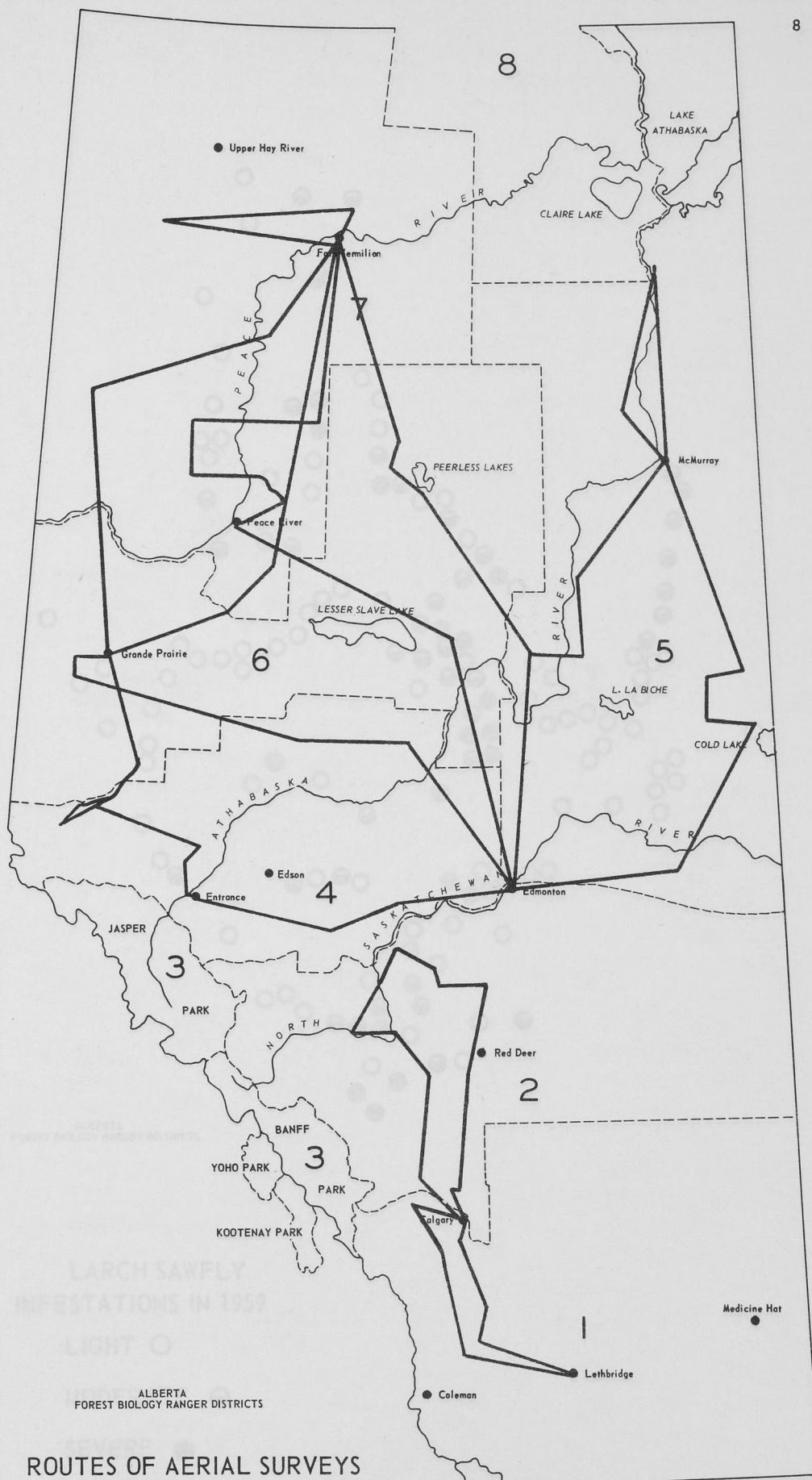
Weather injury to lodgepole pine and aspen was widespread and severe along the foothills and in the adjacent Boreal zone in 1959. This condition was probably caused by frequent temperature inversions which occurred during the winter, and by late spring frosts during the latter part of April.

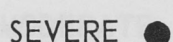
A higher incidence of foliage and cone diseases was noted in 1959 than in the previous year. These included needle cast of lodgepole pine, spruce needle rust and spruce cone rust. Outbreaks of poplar ink spot were found at 2 locations.

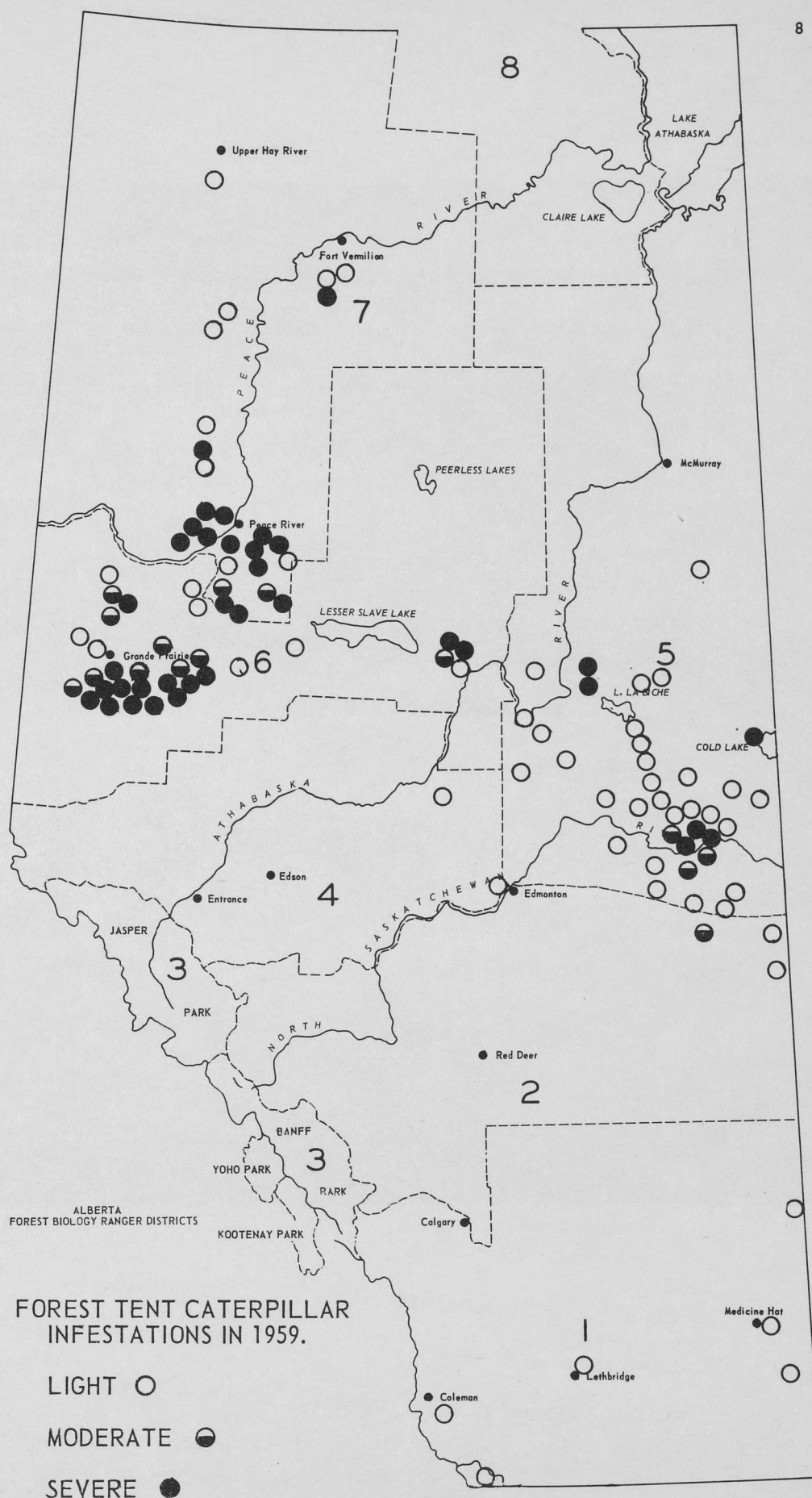
SUMMARY OF AERIAL SURVEYS

DISTRICT	FLT. NO.	PURPOSE	DATE	AIRCRAFT	COST PER HOUR	HOURS	COST			HOURS PER		COST PER DIST.
							A	L	SB+L	A	DIST.	
Crowsnest-Bow River	3	A	June 30	Tri-pacer	25.00	3.50	87.50			3.50	87.50	
Clearwater	4	A	July 3	Tri-pacer	25.00	4.10	102.50			4.10	102.50	
National Parks	-	-	-	-	-	-	-			-	-	
Brazeau-Athabasca	1	A	June 24-26	Cessna 180	42.00	4.30	190.00			5.15	226.00	
Brazeau-Athabasca	5	L	Sept. 1	Cessna 180 (floats)	48.00	.45		36.00				
Lac La Biche	2	A	June 29-30	Cessna 180	42.00	6.10	260.00			7.40	332.00	
Lac La Biche	5	L	Aug. 31	Cessna 180 (floats)	48.00	1.30		72.00				
Slave Lake-G. Prairie	1	A	June 24-26	Cessna 180	42.00	3.00	126.00			6.15	282.00	
Slave Lake-G. Prairie	5	L	Aug. 31-Sept. 1	Cessna 180 (floats)	48.00	3.15		156.00				
Peace River	1	A	June 25	Cessna 180	42.00	3.30	138.00			9.00	402.00	
Peace River	5	L	Aug. 31-Sept. 1	Cessna 180 (floats)	48.00	5.30		264.00				
Northwest Territories	6	SB+L	Aug. 15-18	Cessna 180 (floats)	66.00	21.06			*1,332.00	21.06	1,332.00	
TOTALS						55.56	904.00	528.00	*1,332.00		2,764.00	

A Aspen defoliation surveys
 L Larch sawfly survey
 SB+L Spruce budworm larch sawfly survey
 * Costs borne by the Department of Northern Affairs and Natural Resources.







1 and 2

These 2 photographs, taken near Crooked Creek show defoliation of aspen by the forest tent caterpillar and subsequent refoliation. Photo number 1 was taken in June and number 2 in September.

by - F.J. Emond

3

Clumping of aspen foliage southwest of Nanton, probably the result of winter injury.

by - P.S. Debnam

4

Ranger R.R. Stanley loading Cessna 180 at Cooking Lake in preparation for larch sawfly survey in northwestern Alberta.

by - F.J. Emond



5

Ranger G.C. Bigalow examining
spruce budworm at camp on
Mackenzie River near Fort Norman,
June, 1959.

by - C.E. Brown

6

Outboard cruiser "Borealis"
beached amid river ice driven
ashore near Fort Norman,
June 11, 1959.

by - C.E. Brown

7

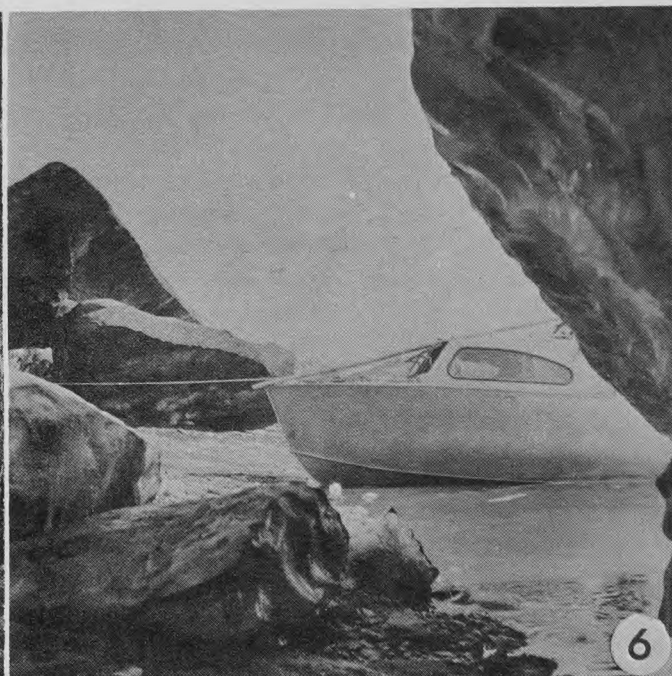
Spruce budworm damage to young
white spruce near Fort Norman,
June 12, 1959.

by - C.E. Brown

8

Spruce budworm damage to mature
white spruce near Fort Norman,
June 12, 1959.

by - C.E. Brown



FOREST BIOLOGY RANGER REPORT
CROWSNEST-BOW RIVER DISTRICT
ALBERTA 1959

by
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FOREST BIOLOGY LABORATORY
CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE
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MARCH 1960

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INTRODUCTION

The Forest Biology survey in the Crowsnest - Bow River District was carried out from May 4 until mid-September in 1959. During this time 202 insect samples and 20 tree disease samples were collected. In August and September field work was hindered by inclement weather.

Prior to the field season 2 weeks were spent working on the ranger cabin at Crimson Lake. Phenology plots were established at 4 locations in the District. Alpine larch at the Highwood Pass and in Banff National Park at Sunshine Lodge and Mt. Temple was again the subject of intensive sampling. Data and seed collections were gathered at the Dominion Forestry seed plots in the District.

The area infested by Bruce spanworm remained much the same as in 1958. Due to winter damage and clumping of the aspen, it was difficult to assess the damage done by this insect. There was little change in the status of the fall cankerworm throughout the Agricultural Districts of Lethbridge, Taber and Medicine Hat. Damage caused by the spruce budworm in the Cypress Hills decreased in 1959.

No new disease outbreaks were recorded and the old outbreaks which were re-examined showed little change from the previous season.

TABLE I

SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	29	Manitoba maple	51
Pine	24	Trembling aspen	39
Blue Douglas fir	5	Misc. poplars	6
Alpine fir	5	Willow	12
Larch	1	American elm	2
		Ash	9
Total	64	Total	119
Collections from miscellaneous hosts			19
Grand Total			202

INSECT CONDITIONS

Forest tent caterpillar, Melacosoma disstria Hbn.

The forest tent caterpillar was again evident on a number of hosts in the city of Lethbridge and surrounding areas. Spraying operations carried out in 1953 in Lethbridge helped reduce populations and only light injury occurred this year. A few colonies of larvae were found in the city of Medicine Hat and in the Empress-Hilda area. In the Cypress Hills larvae of this species were found immediately south of Elkwater townsite but only a trace of damage occurred.

Fall cankerworm, Alsophila pometaria (Harr.)

With the exception of a few locations there was little change in the status of the fall cankerworm from that reported in 1958. Larvae were found on shelterbelts near Three Hills and farther east near Cereal but only a trace of defoliation was seen. East of Highway 2 from High River to Claresholm, larvae were found intermittently and caused light defoliation. East of Claresholm, larvae were more numerous and heavy defoliation occurred. Near Granum, defoliation was light, increasing to moderate a few miles north of Fort McLeod. Conditions near Pearce were much the same as in 1958 and heavy damage was again evident. Damage in the Raymond-Welling area was light while at Magrath it varied from light to heavy. Near New Dayton moderate defoliation occurred and farther south near Milk River there was heavy damage. Defoliation ranged from light to heavy near Wrentham, increased to heavy south of Foremost and decreased to moderate near Orion. Injury to shelterbelts was light between Lethbridge and Taber, moderate south of Purple Springs and heavy between Burdette and Whitlaw. Infestations in the Bindloss-Empress area were light to moderate and north of Suffield they were heavy. Near Retlaw there was heavy damage in some shelterbelts while farther north at Scandia the injury was moderate.

An egg count survey was conducted late in the fall of 1959 to predetermine the areas where fall cankerworm damage could be expected next year. The area included in the survey was that portion of the District south of a line running from Fort McLeod to Vauxhall and Medicine Hat. Judging from this survey, little change is expected in the status of the fall cankerworm in this area except around Milk River, Foremost and Winnifred. In these localities the amount of damage is expected to be lighter in 1960 than in

the previous 2 years.

Injury to aspen.

Aspen stands along the foothills from the Bow River to the Porcupine Hills suffered extensive foliage damage resulting from early spring frosts and defoliation by a number of species of insects. The appearance of the damage caused by the various agents appeared so similar that no accurate proportioning of the damage was attempted.

During the last week of April temperatures along the foothills dropped to well below zero Fahrenheit. As a result, many aspen buds were injured or killed.

Larvae of Bruce spanworm, Oporophtera bruceata Hulst., present in large numbers in this area in 1959 were responsible for most of the defoliation which occurred. A shift in spanworm population from south to north was evident. In the aspen stands north of Turner Valley moderate to heavy defoliation occurred. Farther south, in the area west of Nanton where heavy damage was reported in 1958, the amount of defoliation this year was light to moderate. There was no evidence of Bruce spanworm on aspen at the Experimental Range Station west of Stavely where aerial spraying had been conducted in 1958. The aspen surrounding this area sustained moderate damage.

Also present but contributing little to the overall picture were, the leaf rollers, Compsolechia niveopulvella Cham., Pseudexentera improbana oregonana Wlshm. and the American leaf eating beetle Phytodecta americana (Schffr.). These insects caused light damage in Waterton Lakes National Park, the Cypress Hills and the northeast part of the District from Delia to the Saskatchewan border.

Spruce budworm, Choristoneura fumiferana (Clem.)

Defoliation by spruce budworm was again evident on the east side of the Cypress Hills along the Alberta-Saskatchewan border. The infested area extended south from Battle Creek approximately 4 miles, and about 2 miles west from the Saskatchewan border. Although the size of the infested area was much the same as in 1958 the damage was lighter. The highest populations were found on spruce in the valley bottoms where moderate defoliation occurred. Larvae were found southwest of Elkwater townsite and on the western side of the District south of Blairmore.

Western tent caterpillar, Malacosoma pluviale (Dyar)

This species of tent caterpillar was present in the Crowsnest Pass, Waterton Lakes National Park and the Agricultural Districts of Hanna and Medicine Hat. Throughout the Crowsnest Pass and Waterton Lakes National Park this insect was common but not numerous enough to cause much defoliation. At many locations in the Hanna and Medicine Hat Agricultural Districts tents on wild rose were abundant and defoliation in localized areas was heavy.

Pine needle scale, Phenacaspis pinifoliae (Fitch)

The outbreak of pine needle scale along York Creek Road south of Coleman was re-examined twice during the season. The infestation had decreased in intensity from that reported in 1958.

Black-headed budworm, Accleris variana (Fern.)

Collections of this defoliator were made in Waterton Lakes National Park and along the Kananaskis Trunk Road; damage was light.

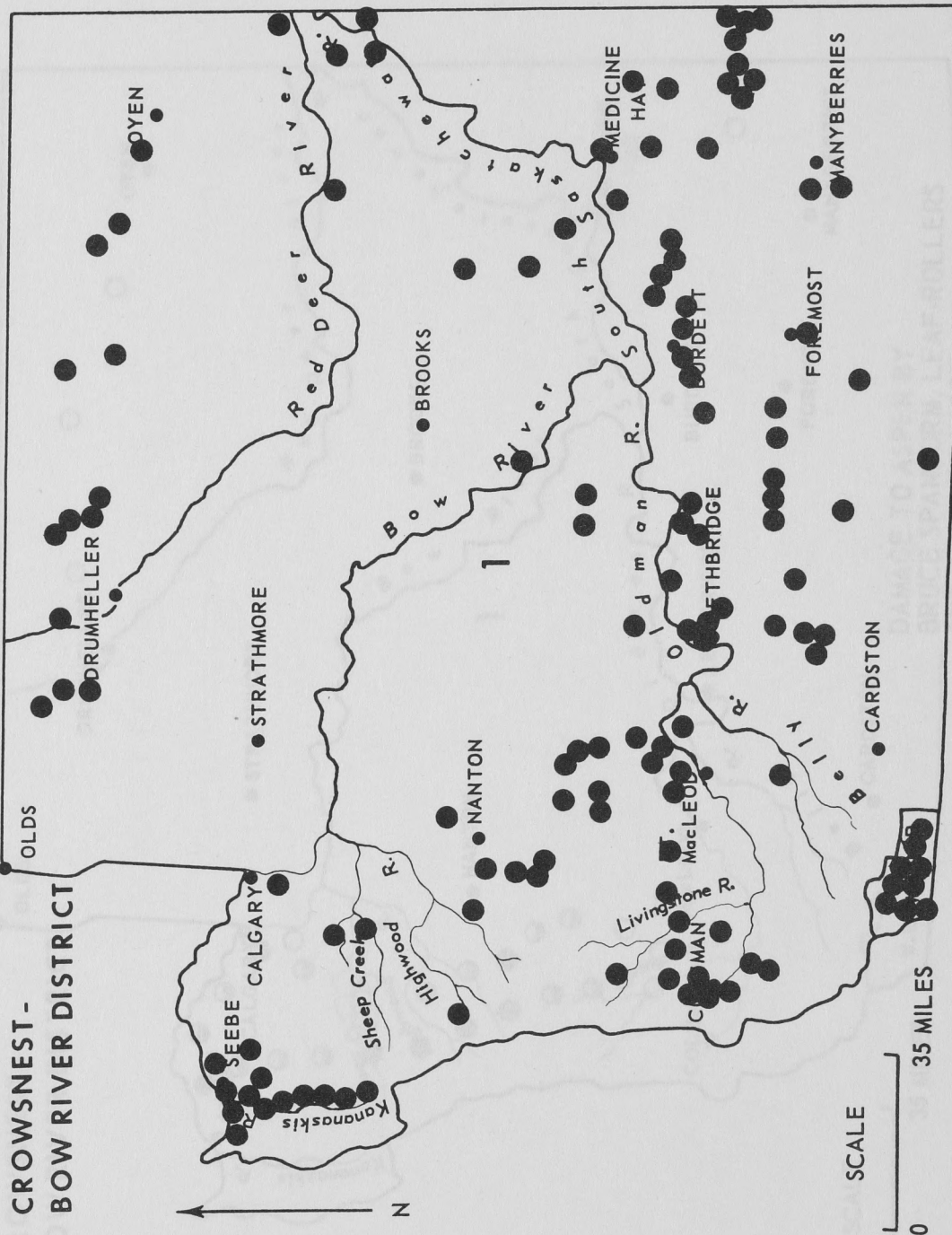
Douglas fir beetle, Dendroctonus pseudotsugae Hopk.

The Douglas fir beetle was present in a stand of Douglas fir in the Porcupine Hills. A cruise in the area affected was carried out in late September. The results of the cruise and report may be found in Appendix "B".

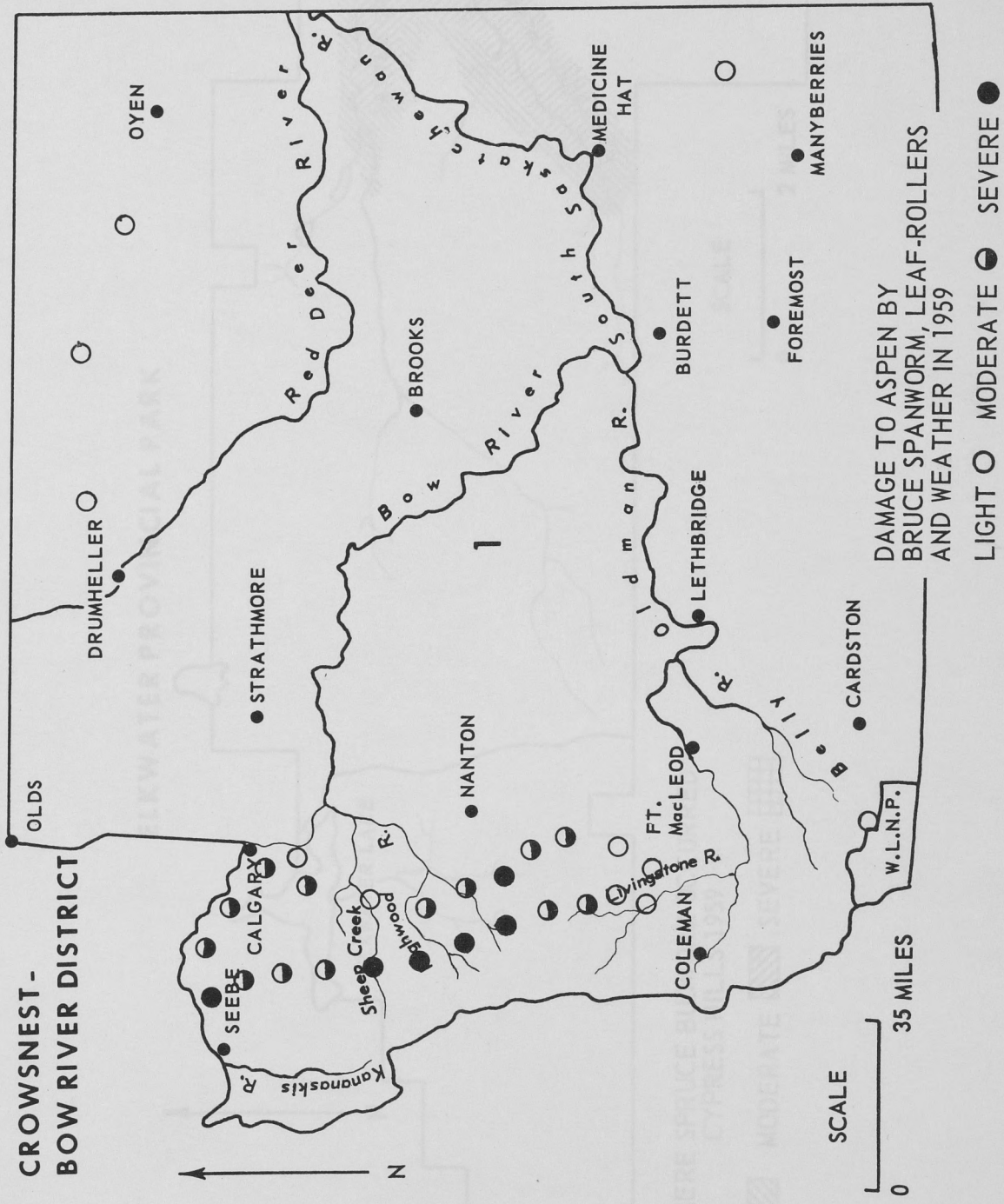
Insect species	No. of coll.	Host	Remarks
Cecropia moth, <u>Hyalophora cecropia</u> (L.)	4	Manitoba maple	Collected between Taber and Medicine Hat.
Lodgepole needle miner, <u>Resurvaria stanki</u> Free.	1	L.P. pine	Light in the Cypress Hills.
Prairie tent caterpillar, <u>Melanocampa lilacivora</u> (M. & S.)	3	Willow, chokecherry, saskatoon	Few tents in Cypress Hills and south of Irvine.
Shoot weevil, <u>Pissodes</u> sp.	1	Spruce	Still present in W.L.N.P.
Spiny elm caterpillar, <u>Pyralis autumnalis</u> L.	2	Willow	Found south of Medicine Hat.
Spruce coneworm, <u>Dioryctria abietella</u> (Verm.)	5	N. spruce	Found with spruce budworm in Cypress Hills.
Elm tent tortrix, <u>Archips cerasivorana</u> (Fitch)	2	Chokecherry	Light damage in W.L.N.P.
Yellow-headed spruce sawfly, <u>Pezomachus alaskensis</u> (Ash.)	2	Spruce	Light damage near Grubbsville and Delta.

TABLE II
OTHER NOTEWORTHY INSECTS
(which occurred in the Crowsnest - Bow River District, 1959)

Insect species	No. of coll.	Host	Remarks
Cecropia moth, <u>Hyalophora cecropia</u> (L.)	4	Manitoba maple	Collected between Taber and Medicine Hat.
Lodgepole needle miner, <u>Recurvaria starki</u> Free.	1	L.P. pine	Light in the Cypress Hills.
Prairie tent caterpillar, <u>Malacosoma lutescens</u> (N.&D.)	3	Willow, chokecherry, saskatoon	Few tents in Cypress Hills and south of Irvine.
Shoot weevil, <u>Pissodes</u> sp.	1	Spruce	Still present in W.L.N.P.
Spiny elm caterpillar, <u>Nymphalis antiopa</u> L.	2	Willow	Found south of Medicine Hat.
Spruce coneworm, <u>Dioryctria reniculella</u> (Grote)	5	W. spruce	Found with spruce budworm in Cypress Hills.
Ugly nest tortrix, <u>Archips cerasivorana</u> (Fitch)	2	Chokecherry	Light damage in W.L.N.P.
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	2	Spruce	Light damage near Craigmyle and Delia.



LOCATION OF POINTS WHERE COLLECTIONS OR FIELD RECORDS WERE TAKEN IN 1959



ELKWATER PROVINCIAL PARK

N

ELKWATER LAKE

BATTLE CREEK

ALBERTA

SASK.

GRANBY CREEK

AREAS WHERE SPRUCE BUDWORM OCCURRED
CYPRESS HILLS 1959

LIGHT



MODERATE



SEVERE



SCALE



FOREST BIOLOGY RANGER REPORT

CLEARWATER DISTRICT

ALBERTA 1959

by

P. F. LaRUE

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CANADA DEPARTMENT OF AGRICULTURE

RESEARCH BRANCH

FOREST BIOLOGY DIVISION

MARCH 1960

INTRODUCTION

The following report gives the results of survey activities for 1959 in the Clearwater District from May 23 until September 25. During this time, 243 insect and 23 disease samples were submitted. Approximately 15,000 miles were travelled by truck on survey work and special projects. Five hundred miles were covered by air on a survey over part of the forested area to determine the status of aspen defoliation. The weather during the field season was cooler with more precipitation than in 1958, making it difficult to visit the more inaccessible areas.

Prior to the field season, approximately one month was used in finishing the cabin which had been erected at Crimson Lake in 1958. At the conclusion of the general survey, one week was spent assisting with a survey of the Douglas fir beetle outbreak in the Porcupine Hills. Sequential sampling for forest tent caterpillar egg masses in the northeastern section of the District was carried on from October 7 to October 10.

Data were again collected from the 5 seed plots established by the Federal Forestry Branch. Four phenology plots were established at various locations in the forested areas. Accompanied by G. Stevenson of the Forest Pathology Laboratory, one week was spent examining outbreaks of Atropellis canker of pine, and checking disease outbreak reports.

Surveys in the agricultural section of the District showed a reduction in the populations of the yellow-headed spruce sawfly. Damage to ornamental and shelterbelt spruce caused by the spruce spider mite was again evident during the

season. Infestations of the American aspen beetle, the Bruce spanworm and the leaf-tier, Pseudexentera improbana oregonana Wlshm., again caused conspicuous defoliation of aspen throughout the District. An increase in the distribution and numbers of the larch sawfly was evident in most of the larch stands visited.

At the request of Dr. J. Nighswander, rust galls and stem rusts were collected from pine throughout the forested areas. An outbreak of *Atropellis* canker was recorded 7 miles east of Nordegg. Dwarf mistletoe on pine was reported by Ranger J. Elliot southwest of Nordegg, but due to inclement weather and poor road conditions this area was not examined.

TABLE I

SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	96	Trembling aspen	78
Pine	23	Willow	10
Larch	23	Poplar	2
Fir	2	Birch	5
Total	144	Total	95
Collections from miscellaneous hosts			4
Grand Total			243

INSECT CONDITIONS

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

The outbreak of this sawfly on ornamental and shelterbelt spruce was lighter than in 1958. In much of the agricultural area, the farmers had sprayed their trees before severe defoliation could occur. The highest populations were again recorded in the Penhold - Delbourne area and north through the Stettler, Ponoka and Camrose districts. Heavy defoliation occurred in isolated instances. Over the remainder of the farming districts larvae of this defoliator were found in light numbers. West of Highway 2 the numbers of this insect were comparatively low.

Larch sawfly, Pristiphora ericksonii (Htg.)

A further increase in the population level and a wider distribution of the larch sawfly was evident in 1959. The heaviest defoliation again occurred south from Rocky Mountain House and Sylvan Lake to the southern limits of larch near Sundre. West of this area to Nordegg, populations had increased and moderate to heavy defoliation was found.

In the vicinity of the larch sawfly plot south of the Clearwater Ranger Station on the Trunk Road, high populations were again found. In the Winfield - Buck Lake region and north of Stettler near Red Willow, there were patches of moderate to heavy defoliation.

Larch sawfly larvae were found wherever larch occurred in the remainder of the District and light to moderate defoliation was evident.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING

LARCH SAWFLY PERMANENT SAMPLE STATIONS

Station No.	Location	Infestation class 1958	Infestation class 1959
2 - 1	Winfield	Moderate	Light
2 - 2	Rocky Mt. House	Light	Severe
2 - 3	Nordeg	Light	Light
2 - 4	Clearwater	Moderate	Moderate
2 - 5	Caroline	Light	Moderate
5 - 3	Millet	Moderate	Light

Bruce spanworm, Operophtera bruceata (Hulst)

Noteworthy changes in the distribution and numbers of this looper occurred throughout the aspen stands in the District. In the forested areas, the only portion heavily infested during the 1959 season occurred from Cochrane west to the Ghost Ranger Station and north to Fallen Timber Creek. North of this area to Rocky Mountain House, populations fell in the moderate category. From Rocky Mountain House to the North Saskatchewan River, populations were generally low with patches of moderate defoliation. Few larvae were found this year in the area west of Rocky Mountain House where heavy defoliation was recorded in 1958. North of Calgary through Olds, Red Deer and Ponoka to Wetaskiwin, defoliation was classed as light. In the remainder of the agricultural district defoliation was generally light with patches of moderate defoliation in the Camrose - Stettler

region. This condition also prevailed in the northeast corner of the District from Lloydminster west to Vegreville and south to the Viking and Wainwright areas.

Aspen defoliators, Pseudexentera improbana oregonana Wlshm., Choristoneura conflictana Hlst. and Phytodecta americana Schffr.

The majority of curled and discoloured aspen leaves in the agricultural district were attributed to the leaf roller P. improbana oregonana. Larvae of the large aspen tortrix were associated with this insect along with the American aspen beetle. Since these 3 species of insects were found in conjunction with the Bruce spanworm, it was difficult to determine the amount of damage the individual species was responsible for. The aspen stands developed a new crop of leaves during July leaving little evidence of the earlier attack by these insects.

Patches of moderate to heavy defoliation occurred in an area bounded by Tofield, Wainwright, Provost, and Camrose. This condition was also present to a lesser degree in the southern part of the District.

In the forested portion of the District isolated patches of heavy defoliation were observed in the Cochrane area, east of Rocky Mountain House and west of Breton. Over the remainder of the District, populations were low.

Forest tent caterpillar, Malacosoma disstria Hbn.

A few larvae of this forest tent caterpillar were collected along the northeastern boundary of District 2. Defoliation caused by this insect was negligible.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING

FOREST TENT CATERPILLAR 1959

DEFOLIATION FORECAST FOR 1960

Location	Predicted defoliation 1960	Location	Predicted defoliation 1960
Edmonton	nil	Ribstone	nil
Provost	not noticeable	Hughenden	nil
Vermilion	noticeable	Lougheed	nil
Rivercourse	noticeable	Phillips	nil
Fabyan	nil		

Spruce spider mite, Olygonychus ununguis (Jac.)

The 1959 examination of the outbreak of this mite on spruce throughout the District showed very little change in the population levels from the previous year. A comparatively dry spring again provided suitable conditions for mating and oviposition. The heaviest damage was found on shelterbelt trees between Calgary and Edmonton. Discoloration and webbing of needles was again observed in the Stettler - Camrose areas and in the surrounding districts. In the forested regions, populations were found to be light with little evidence of damage.

Pitch nodule maker, Petrova albicapitana (Busck)

Nodules of this weevil on regeneration pine were found during the season along the East Lopes Road between the Ghost Ranger Station and Nordegg. Numerous

pitch nodules were observed 3 miles north of the Ghost Ranger Station, and 13 miles north of the Red Deer Ranger Station. The outbreaks of this insect south of Alder Flats and on the Indian Reserve northwest of Rocky Mountain House remained unchanged. Over the remainder of the District, these insects were present in low numbers.

Poplar leaf miner, Phyllocnistis populiella Cham.

There was a noticeable increase in the distribution and abundance of this leaf miner in 1959. Evidence of miner activity was present throughout most of the forested areas of the District. The heaviest populations were recorded in the Strachan area, southwest of the Clearwater Ranger Station and from Rocky Mountain House to Nordegg. Infested leaves were recorded in the agricultural regions in low numbers.

A root borer, Hepialus sp.

Aspen trees in the vicinity of the Forest Biology cabin at Crimson Lake appeared unhealthy. The roots of 10 aspen trees were inspected and all were infested with larvae of a root borer Hepialus sp.

The roots of 10 alder trees in this area were examined and of these, 7 showed signs of damage by the same insect species.

Grey willow leaf beetle, Galerucella decora (Say)

Damage caused by this beetle to willow was recorded in the Lloydminster area and west to Vegreville. Due to the lateness of the season when this area was checked no specimens were taken. However the characteristic skeletonized leaves were evident on the fringes of poplar bluffs and along side roads.

Bark beetles, Ips pini (Say)

Approximately 5 miles west of the Forest Biology cabin at Crimson Lake, mature lodgepole pine trees had been attacked by this beetle. These trees had suffered over the past 3 years from "red belting." This climatic condition appears to have weakened the trees to such an extent that they became susceptible to attack by secondary bark beetles.

TABLE IV

OTHER NOTEWORTHY INSECTS

(which occurred in the Clearwater District, 1959)

Insect species	No. of coll.	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	20	W. spruce	Found commonly in forested section in District.
Gall aphids on conifers, <u>Adelginae</u>	9	W. spruce	Common in most spruce stands.
A sawfly, <u>Anoplonyx</u> sp.	6	Larch	Low populations in most larch stands examined.
Grey pine looper, <u>Caripeta angustiorata</u> Wlk.	15	L.P. pine	Common on pine in fall.
Spruce budworm, <u>Choristoneura fumiferana</u> (Clem.)	7	W. spruce	Taken vicinity of Rocky Mountain House.
Green-striped caterpillar, <u>Feralia jocosa</u> Gn.	8	W. spruce	Small numbers of larvae taken in scattered localities.
A looper, <u>Itame loricaria</u> Evers.	18	T. aspen	Throughout District.
A woolly bear, <u>Lexis bicolor</u> Grt.	22	W. spruce	Found more commonly than in 1958.

Other noteworthy insects.....continued

Insect species	No. of coll.	Host	Remarks
Balsam fir sawfly, <u>Neodiprion abietis</u> (Harr.)	19	W. spruce	Distributed throughout the District.
A sawfly, <u>Neodiprion</u> sp.	11	L.P. pine	Fairly common in forested areas.
Green-headed spruce sawfly, <u>Pikonema dimockii</u> (Cress.)	59	W. spruce	Present in all spruce stands examined.
A weevil, <u>Pissodes</u> sp.	6	W. spruce	Found in endemic numbers.
Green spruce looper, <u>Semiothisa granitata</u> Gn.	27	W. spruce	Fairly common in forested area.
Green larch looper, <u>Semiothisa sexmaculata</u> Pack.	6	Larch	Common in nearly all areas where larch grows.
A root weevil, <u>Hylobius</u> sp.	4	L.P. pine	Larvae and galleries present in most lodgepole pine stands in Clearwater Forest Reserve.

DISEASE CONDITIONS

Atropellis piniphila (Weir) Lohman & Cash

Two new areas in which lodgepole pine was affected by this stem canker were added to the known distribution of this disease during the 1959 season. One was 10 miles east of Nordegg and covered approximately 4 square miles. Assisted by personnel from the Forest Pathology Laboratory this outbreak was mapped for further study. The other area infected by this canker was a 3 mile strip along the Trunk Road approximately 20 miles south of Nordegg. This area will be checked and mapped during the 1960 field season.

Re-examination of the older outbreaks of this stem canker showed no change in the boundaries from the previous year.

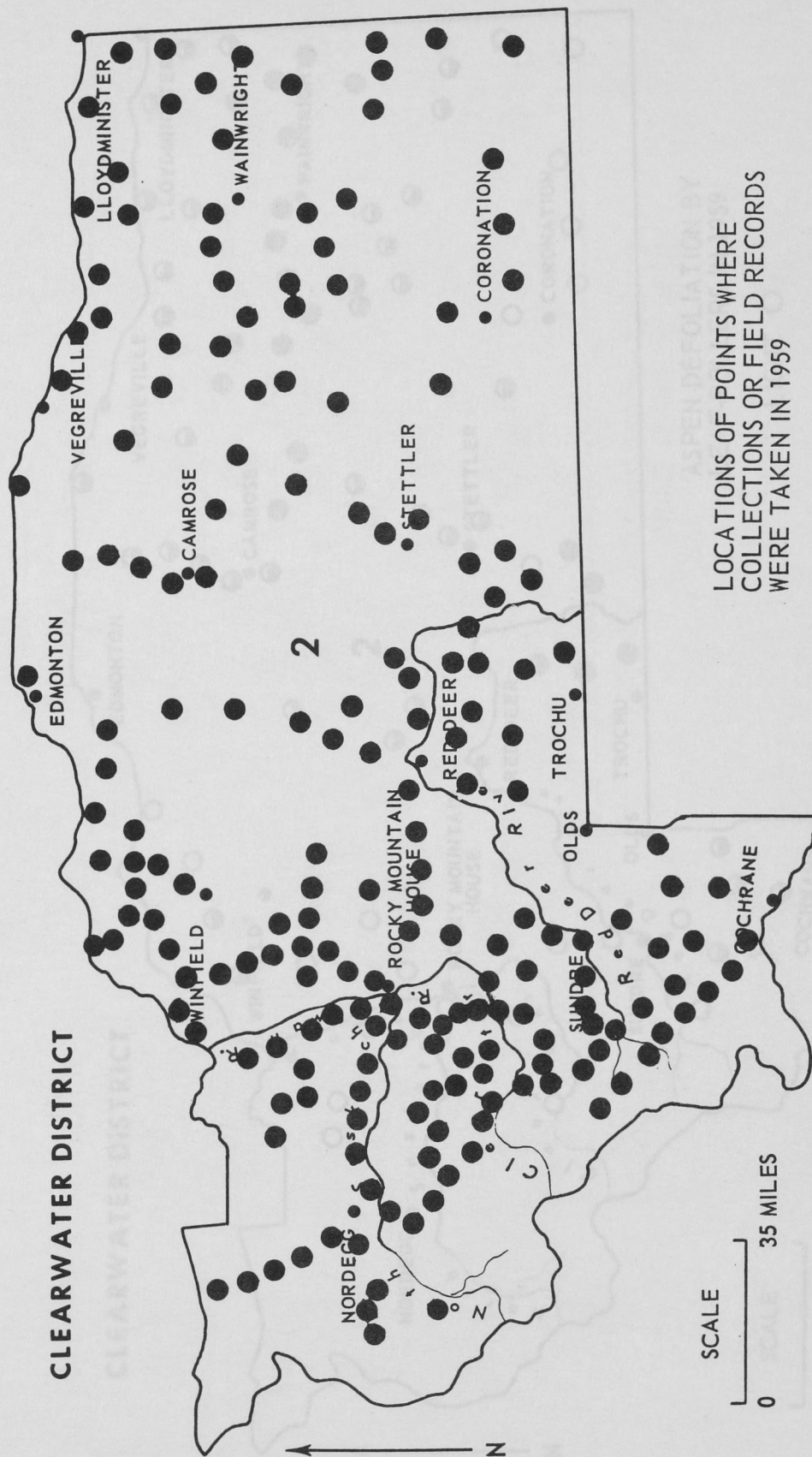
Red belting of lodgepole pine

Red belting of pine was observed 39 miles north of Nordegg in the vicinity of Brown Creek on southern and western slopes and approximately 10 miles up the Camp 15 Road of the Atlas Lumber Company.

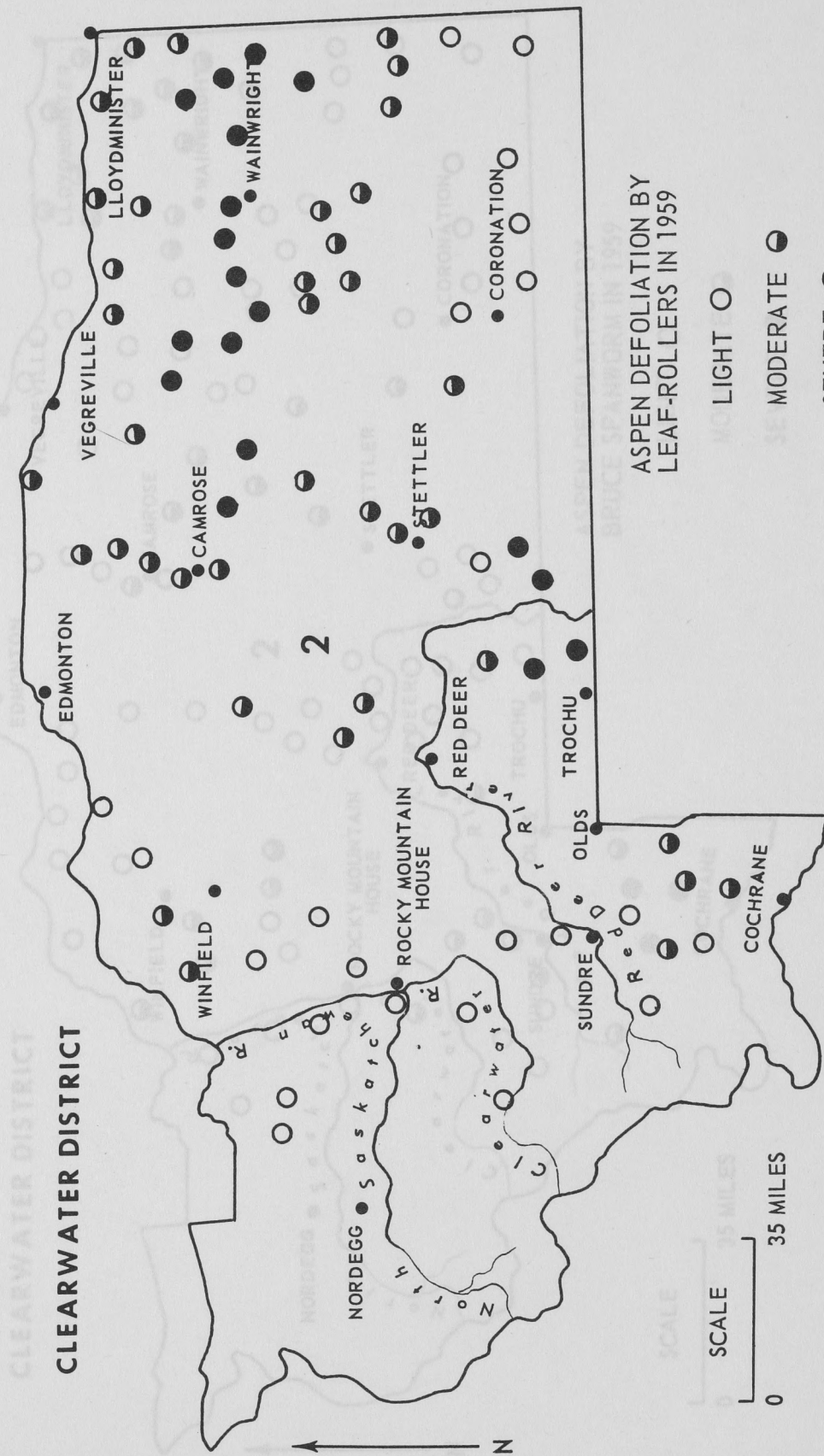
Approximately 5 miles west of the Crimson Lake cabin, severe discoloration of pine was evident in a strip one half mile wide and 2 miles long. Investigation revealed that the mid and upper crown of the affected trees appeared dead. The new buds were black and had not opened. By the latter part of the summer some new growth had taken place but was very sparse and stunted. This condition has persisted in this area for the past 2 years and has weakened the trees to the extent that they have now become susceptible to attack by bark beetles.

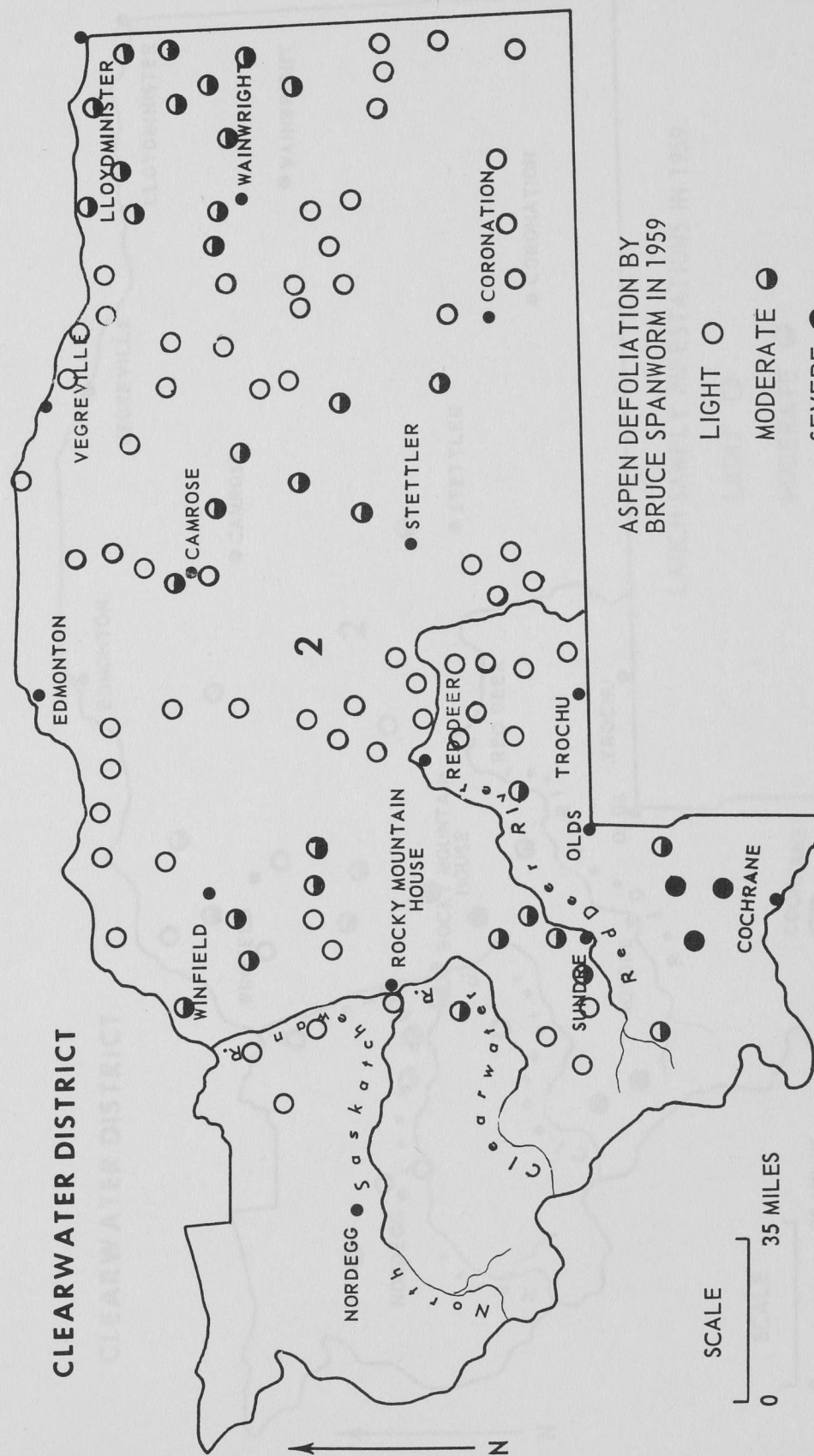
Weather damage to aspen poplar

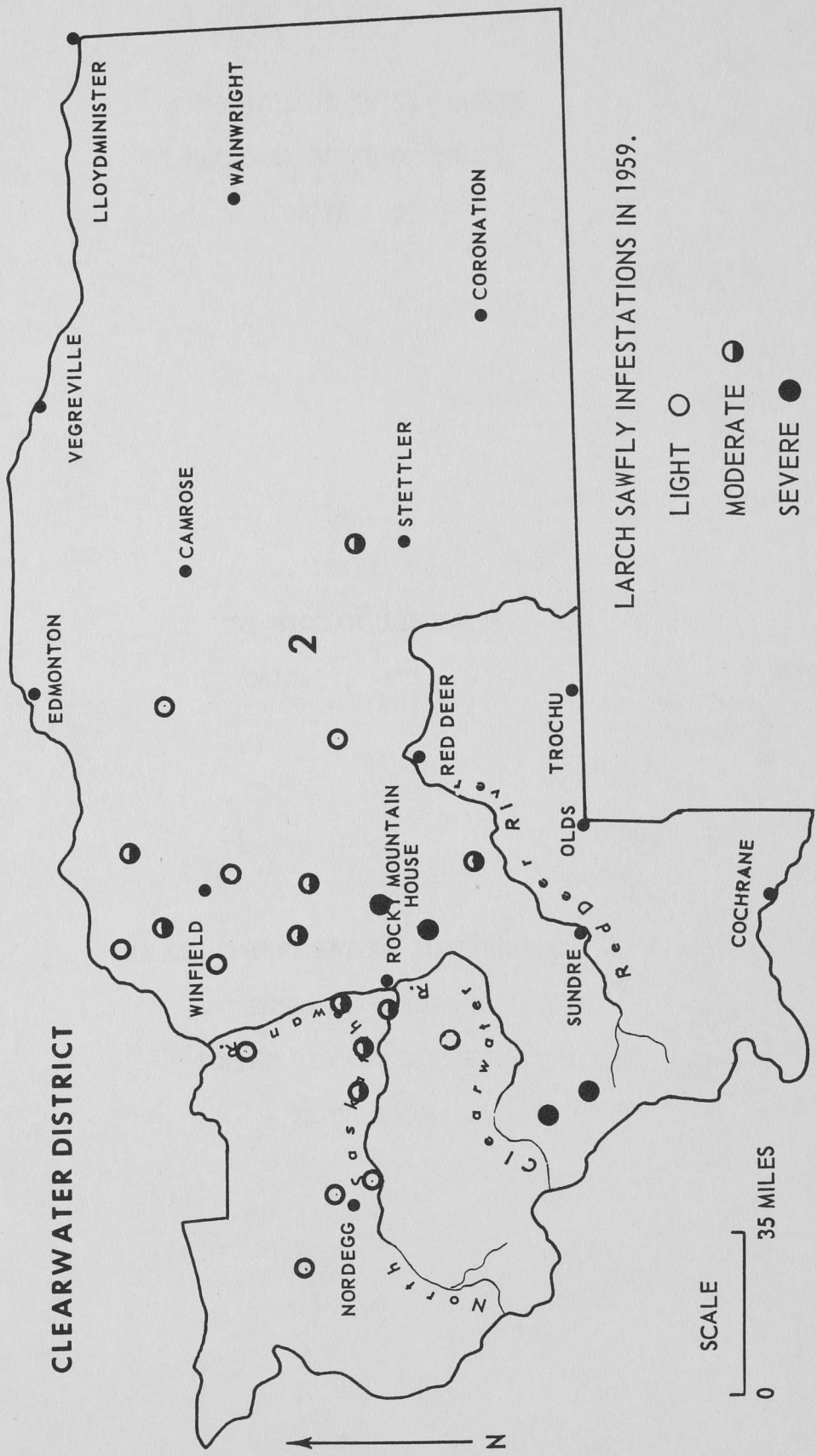
In portions of the Clearwater District, patches of aspen failed to leaf out during May due to late frosts. This condition occurred west of Rocky Mountain House from the Shundra Ranger Station south to the Ram River. This condition also prevailed in the northern part of the District from St. Francis to the North Saskatchewan River. The aspen in these areas leafed out during the early part of June but with fewer leaves than in the surrounding district. These areas were heavily infested by the Bruce spanworm in the spring of 1958. It is possible that due to the lack of foliage during May the populations of these insects starved before the new crop of leaves were produced by these trees.



LOCATIONS OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1959







FOREST BIOLOGY RANGER REPORT

NATIONAL PARKS DISTRICT

ALBERTA 1959

by

J. PETTY

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CANADA DEPARTMENT OF AGRICULTURE

RESEARCH BRANCH

FOREST BIOLOGY DIVISION

MARCH 1960

INTRODUCTION

The field season in the National Parks District started June 3 and ended September 16. The number of miles travelled by vehicle in this period was 18,714. A total of 208 insect samples and 18 disease samples were collected.

Prior to the field season 10 days were spent working on the cabin at Crimson Lake, 3 weeks in District I instructing the new ranger, and 6 days on construction and maintenance at the trailer court at Eisenhower Field Station.

After the conclusion of the field season in the National Parks District special surveys were carried out in the Bow River and the Clearwater Districts. These included a cruise in a stand of Douglas fir in the Porcupine Hills to determine the timber loss caused by the Douglas fir beetle, sequential sampling for forest tent caterpillar in the Clearwater District, and a survey to pre-determine the areas in the agricultural part of the Crowsnest-Bow River District where fall cankerworm damage can be expected in 1960.

From information received in 1958 it was found that phenology data could be more easily obtained from lodgepole pine than from spruce. For this reason 5 plots were established in lodgepole pine stands to replace the spruce plots which were used in 1958. Data from these plots were collected twice in the season. During the field season the seed plots set out by the Dominion Forest Service were again visited.

There were no major outbreaks of forest insects or diseases in the National Parks District in 1959. Poplar serpentine miners were again present in high numbers along the western boundary of Yoho and Jasper National Parks. Populations of the spruce budworm appeared to be on the increase. Sequential sampling for the lodgepole needle miner showed this species to be on the decline.

Douglas fir needle cast was found west of Banff and a needle cast of lodgepole pine, Lophodermium pinastri (Schrad.) Chev. caused light damage in several areas in the District.

TABLE I
SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	59	Trembling aspen	22
Pine	28	Willow	28
Larch	7	Poplar	6
Fir	13	Birch	2
Douglas fir	<u>14</u>	Manitoba maple	<u>14</u>
Total	121	Total	72
Collections from miscellaneous hosts			15
Grand Total			208

INSECT CONDITIONS

Poplar serpentine miner, Phylloconistis populiella Chamb.

Aspen poplar in all of the National Parks were damaged to some degree by this leaf miner. The heaviest damage was found in Jasper and Yoho National Parks. In Jasper National Park heavy injury occurred around Jasper townsite and west to Geikie along the Yellowhead route. From Geikie to the west boundary of the Park damage was moderate. Light to moderate injury was evident north of Jasper to Celestine Lake, and along Highway 16 to the east

gate of the Park where only a few mined leaves could be found. Moderate damage was observed up the Maligne Canyon Road and south of Jasper to Portal Creek.

In Yoho National Park heavy damage was found between Leachcoil and Field and for a short distance up the road to Emerald Lake. Light damage was present west of Leachcoil to the Park gate and between Field and the Banff-Yoho boundary.

A small area 13 miles west of Banff, in Banff National Park, was moderately to heavily damaged. Throughout the remainder of this Park only light damage was observed.

The damage to aspen poplar by this leaf miner in Kootenay National Park was light in 1959.

Spruce budworm, Choristoneura fumiferana (Clem.)

Light infestations of spruce budworm were found in numerous locations in Yoho National Park. Since 1959 was not the flight year, larvae were small and the resulting damage was light. However, if a high percentage of larvae survive overwintering, moderate damage to new growth in 1960 can be expected at the following locations: along Boulder Creek, along the west side of the Kicking Horse River between the Otterhead and Amiskwi Rivers, 2 miles south of Emerald Lake and near Kicking Horse Campground in the Yoho Valley.

In Banff National Park between Mile 84 and 85 on the Banff-Jasper Highway light damage to spruce and fir was observed. Heavier defoliation can also be expected in this area in 1960.

Black-headed budworm, Acleris variana (Fern.)

Collections containing larvae or pupae of the black-headed budworm were made in all National Parks except Kootenay in 1959. Light damage was noted

between Lake Minnewanka and Jim Coon Creek along the Cascade Fire Trail, and for approximately 2 miles south of Banff along the Spray River Valley. With the exception of a very small area at the mouth of the Yoho Valley in Yoho National Park, where very light damage was seen. Few budworm were found in the rest of the area and damage was negligible.

Willow leaf beetles, Galerucella carbo (Lec.), Galerucella decora (Say)

The Pacific willow leaf beetle, G. carbo, caused light to moderate defoliation of willow in the southern half of Kootenay National Park. The area affected was along either side of the Kootenay River for its entire length within the Park and between Radium Hot Springs and the summit of Sinclair Pass.

Damage by the grey willow leaf beetle, G. decora, was heavy on a few willow bushes in a small area 24 miles south of Banff along the Spray River Fire Trail.

Spruce spider mite, Oligonychus unguis (Jac.)

The townsites of Banff and Jasper and the vicinity of Radium Hot Springs were the only localities where spruce mite was found in 1959. In Banff light populations were present on most of the spruce that have been planted as hedges along the boulevards, or as ornamental trees. However a few of the hedges had moderately heavy populations on them. The infestations in Jasper and at Radium Hot Springs were light.

Lodgepole needle miner, Recurvaria starki Free.

Sequential sampling was again carried out at 10 locations throughout Yoho, Kootenay and Jasper National Parks. There were 2 locations where larvae were found, at Black Creek and Hawk Creek in Kootenay National Park. In each instance population classification was light. At the remainder of the

locations no larvae were found.

In Banff National Park the sampling for lodgepole needle miner was done by staff from Eisenhower Field Station. Very low populations persisted at Mt. Girouard, Massive Mountain and Mt. Eisenhower.

A leaf beetle, Chrysomella aenicollis Schaeff.

A light infestation of these leaf beetles was found in the Cascade Valley from Lake Minnewanka to Flint Park and Sawback Lake. Northeast of Sawback Lake in an area approximately 3 miles long and a half mile wide, moderately heavy defoliation of willow occurred. Two other small areas of light damage were seen, one a mile east of Temple Ski Lodge in Banff National Park and the other in Yoho National Park 3 miles up the Amiskwi Valley.

Pitch nodule maker, Petrova albicapitana (Busck)

Pitch nodule makers were found on regeneration lodgepole pine in Jasper National Park along the west side of the Athabasca River from Whirlpool River north to Jasper townsite, and west of the town for approximately 4 miles along the Yellowhead Road. A few of the smaller trees had dead tops resulting from the feeding of this insect. This is the first time this species has been recorded in Jasper National Park.

A weevil, Pissodes sp.

Damage to regeneration spruce in Kootenay National Park by this weevil was found along both sides of the Kootenay River for its entire length within the Park. The heaviest injury was found between Kootenay Crossing and the north Boundary of the Park. In this area 30-50 per cent of the trees have been attacked.

In Yoho National Park damage to spruce was confined to a small area along the Kicking Horse River north of the Ottertail River.

Larch sawfly, Pristiphora ericksonii (Htg.)

This sawfly was again found in the small stand of eastern larch growing beside the Miette Hot Springs Road in Jasper National Park. A few larch trees sustained moderate defoliation with light injury to the remaining trees in the stand. The needle growth was very short on many of the larch giving the impression of heavier defoliation than actually occurred.

TABLE II

OTHER NOTEWORTHY INSECTS

(which occurred in the National Parks District, 1959)

Insect species	No. of coll.	Host	Remarks
Balsam fir sawfly, <u>Neodiprion abietis</u> (Harr.)	14	White spruce Douglas fir Black spruce	Few larvae found throughout Banff, Jasper and Yoho National Parks.
Balsam shoot sawfly, <u>Fleuroneura borealis</u> Felt	4	Alpine fir	Light damage in Yoho Valley, Amiskwi Valley, Ice River Road in Yoho Park and near Moraine Lake in Banff Park.
Box elder aphid, <u>Periphyllus negundinis</u> (Thos.)	1	Manitoba maple	Moderate infestation in Jasper townsite.
Caragana aphid, <u>Macrosiphum carraganae</u> (Cholod.)	2	Caragana	Light populations in Banff and Jasper townsites.
Green rose chafer, <u>Dichelonyx backi</u> (Kby.)	3	Aspen poplar Spruce Cinquefoil	Moderate defoliation at Hillsdale in Banff Park. Light damage near Jasper townsite.
Pine root collar weevil, <u>Hylobius</u> sp.	1	Lodgepole pine	No change over previous years.

Other noteworthy insects.....continued

Insect species	No. of coll.	Host	Remarks
Pitch-mass borer, <u>Parharmonia pini</u> (Kellicott)	3	Spruce	Pitch nodules found in various localities in Banff Park.
Spiny elm caterpillar, <u>Nymphalis antiopa</u> L.	11	Willow Aspen poplar Alder	Light damage south of Banff. Few larvae found in various locations in Jasper Park.

DISEASE CONDITIONS

Needle cast on lodgepole pine, Lophodermium pinastri (Schrad.) Chev.

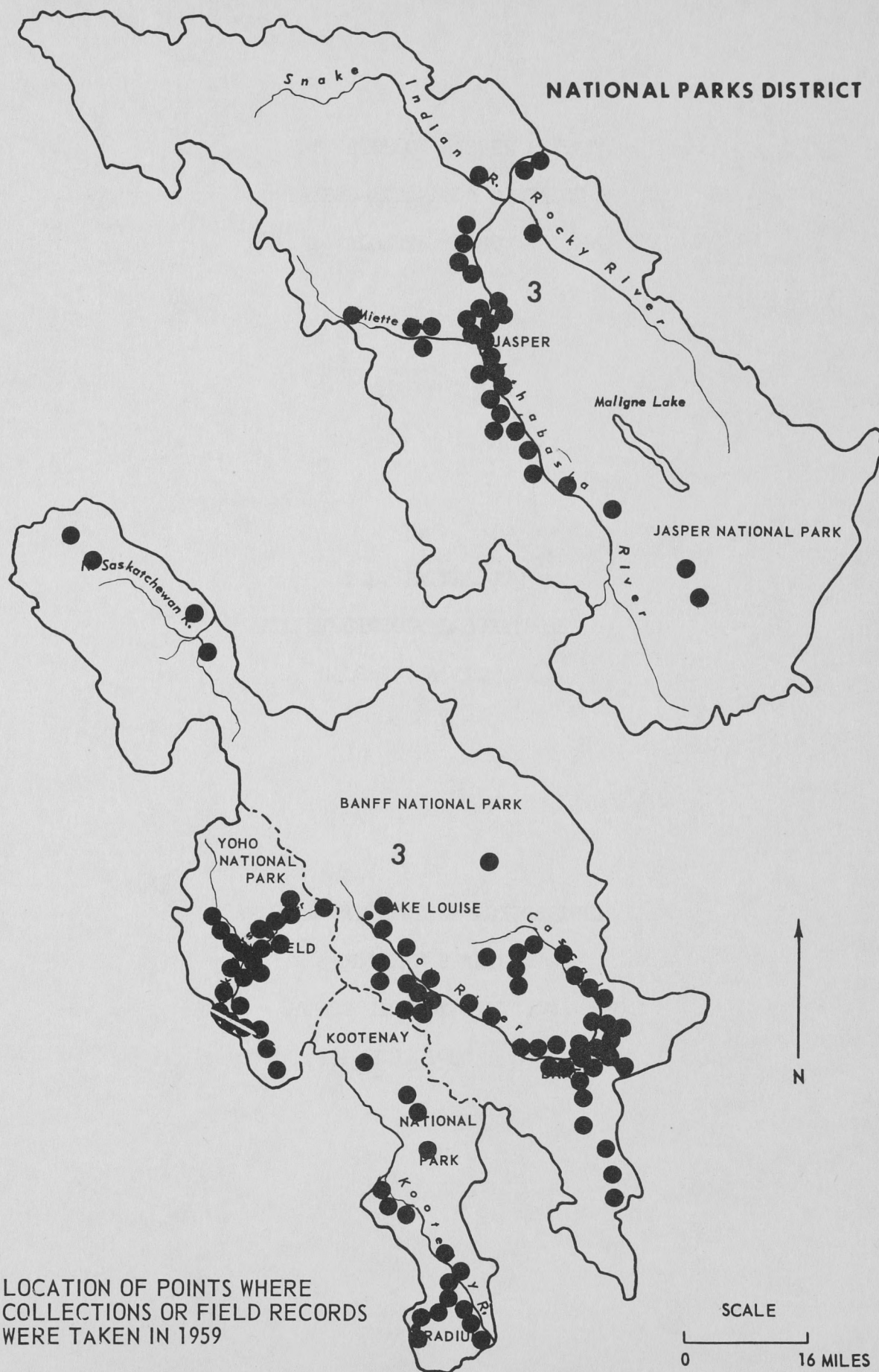
There were 2 areas in which this needle cast was found in 1959. One of the areas extended for approximately 4 miles north from the bridge crossing the Whirlpool River in Jasper National Park, where 75 per cent of the trees were affected. The other area was in Kootenay National Park along the East Kootenay Fire Trail, where damage was sporadic and generally light.

Douglas fir needle cast, Rhabdocline pseudotsugae Syd.

In a stand of Douglas fir 10 miles west of Banff on the north side of the Bow River, a high percentage of the trees were affected by this needle cast.

Winter injury of pine.

"Red Belt" was again in evidence north of Jasper townsite. For the first 10 miles along the Athabasca Valley this condition was found in small patches but north of this point it was almost continuous. Winter injury was also evident up the Rocky River Valley for a short distance, up Fiddle River Valley and Sulphur Creek to beyond Miette Hot Springs, where browsing was severe, and up the Snake Indian Valley for approximately 8 miles.



LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1959

FOREST BIOLOGY RANGER REPORT

BRAZEAU-ATHABASCA DISTRICT

ALBERTA 1959

by

V.B. PATTERSON

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

RESEARCH BRANCH

FOREST BIOLOGY DIVISION

MARCH 1960

INTRODUCTION

This report covers tree insect and disease conditions in the Brazeau-Athabasca District in 1959. General field survey work was carried out from May 26 to September 11, during which time 12,000 miles were travelled by truck and approximately 500 miles by air. Two hundred and twenty insect samples and reports and 29 disease samples and reports were submitted.

The first 2 weeks in May were spent at Lac La Biche assisting with the construction of a new ranger headquarters. Approximately 2 weeks were spent on repair and maintenance of the Entrance cabin.

An aerial survey was made in June for the purpose of checking on aspen defoliation in areas inaccessible by road. On this survey 500 miles were covered within the boundaries of the District, and another 1500 miles were covered in Districts 5, 6 and 7 with the Rangers in those Districts.

Phenology plots were established in stands of young pine at Entrance, Whitecourt and Lovatville and a site chosen for a fourth plot to be established in the Muskeg River area in 1960. The Federal Forestry seed study plots were re-examined in mid-August. The larch sawfly permanent sample plots were checked and sequential sampling in these plots was carried out in late August and early September.

Assistance was given on a bark beetle cruise in the Porcupine Hills and on a fall cankerworm survey in the south-central part of District I.

The weather during the latter half of June and throughout August and early September was much wetter than in previous years. Road conditions have improved and new roads have been built into areas previously inaccessible. Many of these are not all-weather roads and are often impassable.

There was a marked decrease in the amount of injury caused by aspen defoliators throughout the District with the exception of a narrow strip from Edmonton to Barrhead where injury was heavy. The incidence of larch sawfly was also lower than in 1958. The boundaries of the area in which the yellow-headed spruce sawfly was recorded in previous years were unchanged but populations were generally lower and the resulting injury was light.

Much emphasis was placed on recording the occurrence of tree diseases, particularly in the western half of the District. A westward extension of the Atropellis canker outbreak in the Robb area was recorded, and an outbreak not previously reported was found north of the Muskeg River. Evidence of this canker was also recorded at a number of points west of Whitecourt.

There was little change in the boundaries of the known disease outbreaks which were re-examined in 1959. Information gathered at Whitecourt indicated that the outbreak of dwarf mistletoe in that area may be larger than previously recorded. A more extensive survey of this area will be carried out in 1960.

Collections of the Bracon species were taken throughout the area surveyed in May and June. Larval counts were usually low at each location and injury was negligible. The only areas where noticeable injury could be attributed to this species were at the west end of Lake Wabaman, south of Tumbach and east of Etivakle.

A leaf-tier, *Pseudocentrus imitator* *progenus* Wlsm.

This species of leaf-tier was found in aspen bluffs throughout the agricultural area east of a line from Fort Assiniboine to the west end of Lake Wabaman. A few collections were made west of this line but the damage was negligible. Heavy injury occurred along the North Saskatchewan River Valley in Edmonton, and in bluffs on the northern outskirts of the city. Aspen bluffs

TABLE I

SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	28	T. aspen	77
Pine	46	Poplar	17
Larch	29	Willow	10
Fir	4	Alder	5
Total 107		Total 109	
Collections from miscellaneous hosts			4
GRAND TOTAL			220

INSECT CONDITIONSBruce spanworm, Operophtera bruceata (Hulst)

Collections of the Bruce spanworm were taken throughout the area surveyed in May and June. Larval counts were usually low at each location and injury was negligible. The only areas where noticeable injury could be attributed to this species were at the west end of Lake Wabamun, south of Tomahawk and east of Entwistle.

A leaf-tier, Pseudexentera improbana oregonana Wlshm.

This species of leaf-tier was found in aspen bluffs throughout the agricultural area east of a line from Fort Assiniboine to the west end of Lake Wabamun. A few collections were made west of this line but the damage was negligible. Heavy injury occurred along the North Saskatchewan River Valley in Edmonton, and in bluffs on the northern outskirts of the city. Aspen bluffs

northwest of the city as far as Barrhead were moderately to heavily defoliated. Small scattered patches of moderate to heavy defoliation also occurred west of the city as far as Carvel. West of Carvel the amount of defoliation tapered off sharply.

In the Wabamun Lake area where aspen had been heavily defoliated by a complex of insects in the past several years, injury was very light.

Grey willow leaf beetle, Galerucella decora (Say)

Larvae and adults of the grey willow leaf beetle were found at various locations throughout the eastern half of the District. Adults were found on aspen and balsam poplar late in May and throughout June. The injury was generally light and confined mostly to the understory. However, there was moderate injury to these hosts near Barrhead, Highridge, Lac St. Anne and Carvel. Later in the season, larval feeding caused heavy skeletonizing of willow along Highway 16 north of Duffield.

Poplar serpentine miner, Phylloconistis populiella Chamb.

Mining of aspen poplar leaves by this leaf miner was general between Edson and Hinton, south of Edson along the Coal Branch Road and west of Rock Lake. At most locations sampled, the mined leaves were so numerous that the foliage took on a silvery appearance. The heaviest infestations were around Jarvis and Rock lakes, and near Hinton, Marlboro, Bikerdike, Erith and Weald.

Larch sawfly, Pristiphora ericksonii (Htg.)

The larch sawfly infestation in 1959 decreased in area and intensity from that reported in 1958. A complete coverage of the District for this insect species could not be made due to poor road conditions during the latter part of the field season.

Moderate to severe injury occurred in the few tamarack stands scattered throughout the agricultural lands west of Edmonton to Duffield. Injury was light to moderate along Highway 16 from McKay to Wolf Creek. Moderate defoliation was recorded in isolated patches northwest of Entrance at 12 Mile Creek, south of Iosegun Lake on Highway 43, and in the permanent sample plot east of Whitecourt. Injury was moderate to severe in the permanent sample plot north of Barrhead.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING

LARCH SAWFLY PERMANENT SAMPLE PLOTS

Station No.	Location	Infestation class 1958	Infestation class 1959
4 - 1	Edmonton	Severe	Moderate
4 - 2	Gainford	Moderate	Light
4 - 3	Peers	Nil	Light
4 - 4	Mercoal	Nil	Light
4 - 5	Obed	Nil	Nil
4 - 6	Muskeg River	Nil	Nil
4 - 7	Whitecourt	Severe	Moderate
4 - 8	Iosegun Lake	Light	Nil
4 - 9	Barrhead	Severe	Severe

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Defoliation of spruce by the yellow-headed spruce sawfly was lighter than has been recorded in previous years. In the Barrhead-Westlock-Morrinville area, larvae were observed on spruce in most farm shelterbelts. Injury was moderate at a small percentage of these locations but light generally.

In the Edmonton-Stony Plain area, injury was heavy on black spruce at one location and moderate on white spruce at another. In the majority of other spruce shelterbelts observed in this area injury was light and at several there was no evidence of damage.

A leaf miner on alder, Gracilariidae

A species of leaf miner was recorded in 3 separate areas in late August and early September. Along the Pembina River between Evansburg and Entwistle approximately 80 per cent of all leaves on alder were mined. Along McPherson Creek south of Hargwen there was moderate injury over a small area. West of the Athabasca Bridge near Whitecourt for approximately 15 miles along Highway 43, 60-70 per cent of the leaves were mined. At each location the alder had acquired a brown appearance resembling heavy frost damage.

Pine root collar weevil, Hylobius sp.

A particular effort was made to record the incidence of the pine root collar weevil attacking lodgepole pine.

A thorough check was made south of Hinton and along the Coal Branch roads south of Robb to Luscar, Mountain Park and Lovatville, but no evidence of this species was found.

A survey south of Hargwen revealed evidence of injury at only one location. The Marlboro area, where infestations have been reported in previous years, was not completely checked due to bad roads. However, negative results were obtained from all trees that were checked in this area.

Spot checks along Highway 16 revealed evidence of injury at only one point, a few miles southeast of Carrot Creek Post Office.

A survey was made along the Pass Creek Road 20 miles west of Whitecourt. The results of this and other surveys are listed in the following table.

TABLE III

Pine root collar weevil, Hylobius sp. in the Brazeau-Athabasca District in 1959.

Location	No. of trees inspected	No. of trees infested	Remarks
Pass Creek Road Mile 15	10	3	
Mile 24	7	5	
Mile 60	10	3	
Mile 64	10	9	
Mile 80	10	0	
Fox Creek - (New Ranger Station west of townsite)	100	3	Injury only to trees in low area north of Ranger Station.
Iosegun Creek	10	4	
Simmonette Tower	10	0	
Muskeg River	10	4	
Hargwen	6	6	
Marlboro	20	0	
Mercoal	10	0) Representative of all sampling for <u>Hylobius</u> <u>sp.</u> south of Robb.
Luscar	10	0	
Cadomin	5	0	
Lovatville	5	0	
Medicine Lodge	3	0	

TABLE IV

OTHER NOTEWORTHY INSECTS

(which occurred in the Brazeau-Athabasca District, 1959)

Insect species	No. of Coll.	Host	Remarks
Adelginae, <i>Pineus</i> prob. <i>similis</i> Gill.	8	W. spruce	General throughout western third of District. Moderate number of galls at few locations but generally light.
American aspen beetle, <i>Phytodecta americana</i> (Schffr.)	13	T. aspen Willow	Light to moderate injury to fringe trees throughout District.
Geometridae <i>Itame loricaria</i> Evers.	13	B. poplar T. aspen Willow	Few in beating samples in eastern half of District.
Pitch nodule-makers, <i>Petrova</i> spp.	15	L.P. pine	Common to young pine throughout most of District but injury very light.

DISEASE CONDITIONS

Atropellis canker, Atropellis piniphila Weir (Lohman & Cash)

An outbreak of Atropellis canker not previously recorded was found on lodgepole pine along the new forestry road between the Muskeg River and Simmonette Tower. Cankers were common in those stands which had an average DBH of 5 inches and approximate height of 40-50 feet. In some stands of this age class the incidence ran as high as 65 per cent. There was no evidence of the disease in younger stands but cankers were found occasionally on mature trees.

A westward extension of the outbreak in the Robb area was recorded but the new boundaries were not determined.

A high incidence of cankers was found along the Pass Creek Road west of Whitecourt, but the boundaries of the outbreak were not determined.

Stem rusts of pine, Cronartium harknessii Moore Meinecke, and Cronartium stalactiforme A. & K.

Stem rusts on lodgepole pine were found generally throughout that part of the District west of Edson.

The highest incidence of C. stalactiforme was recorded along the north shore of Rock Lake and along the Coal Branch Road south of Robb to Luscar and Cadomin. Approximately 50 per cent of the lodgepole pine in these areas was affected. The rust cankers had been attacked by rodents, causing severe damage to the trunks and branches of a number of trees.

C. harknessii was heaviest in an area comprising several acres approximately 22 miles southeast of Hinton. Along the Oil Road from Entrance to the Simmonette Tower galls were found wherever there were stands of regeneration lodgepole pine. The most easterly record of this species was north of Marlboro where a few galls could be found at each location where young pine was examined.

Canker of poplar, Cytospora chrysosperma (Pers.) Fries.

Several acres of aspen along the Rock Lake Road west of Entrance were infected with this canker. In the area that was inspected there was no evidence of tree mortality.

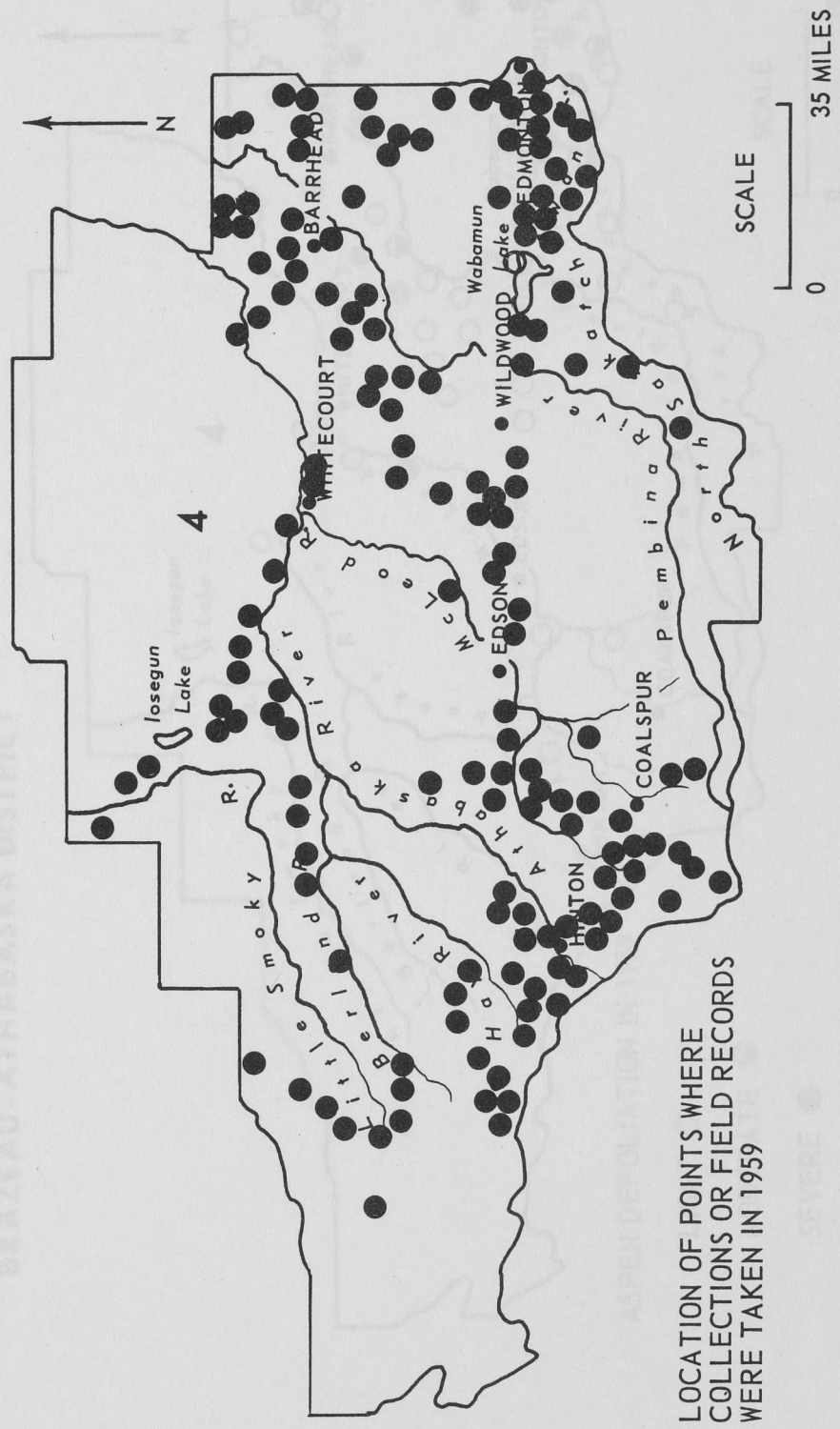
Needle rust of fir, Pucciniastrum goeppertianum (Kuhn) Kleb.

This disease was recorded in the Muskeg River-Simmonette Tower area northwest of Entrance. A high percentage of young fir south of Simmonette Tower for 10 miles along the new forestry road showed evidence of infection. A few individual trees throughout the area had acquired an orange color due to the presence of rust spores on the needles, but generally the infection was light.

BRAZEAU-ATHABASKA DISTRICT

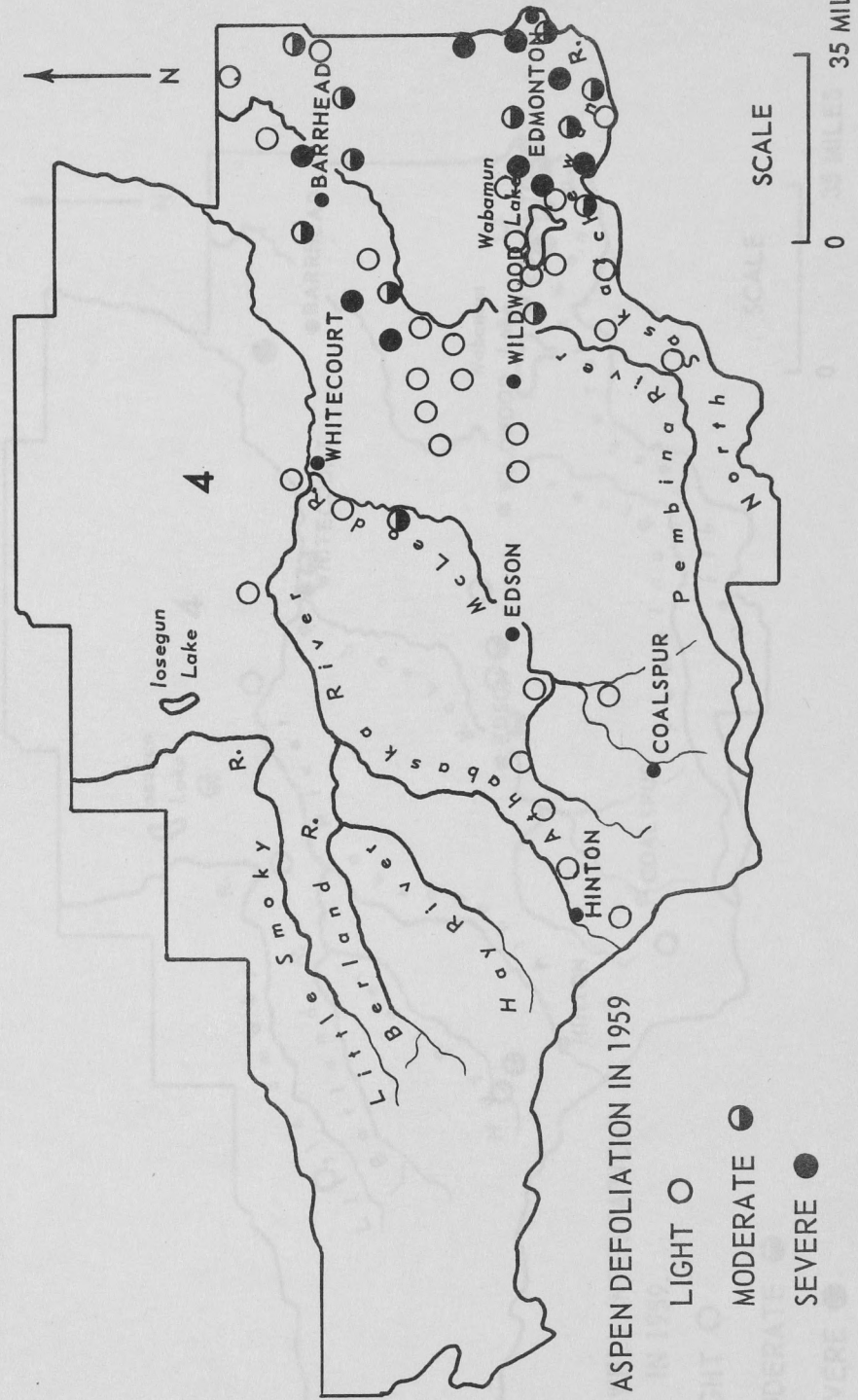
LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1959

BRAZEAU-ATHABASKA DISTRICT

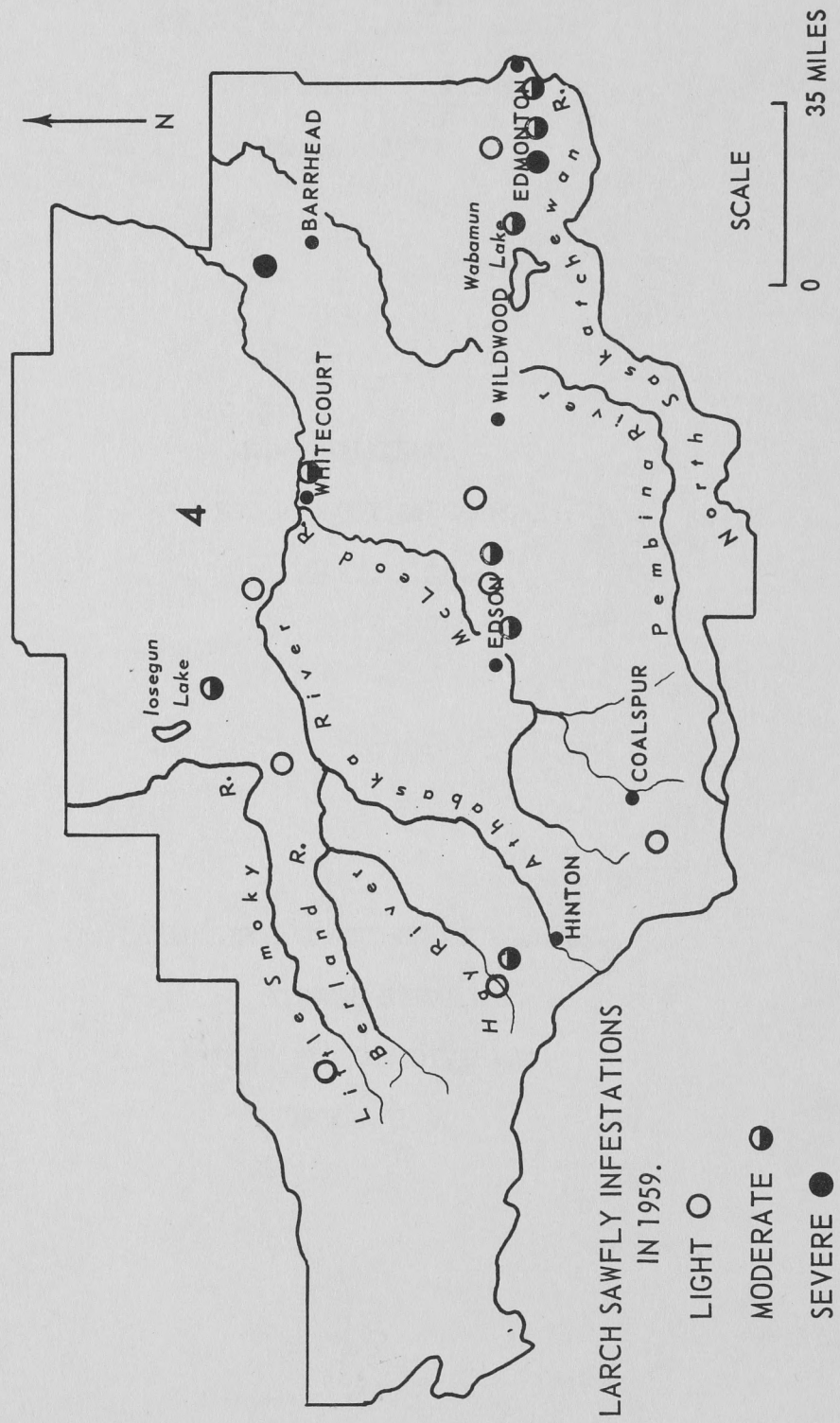


LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1959

BRAZEAU-ATHABASKA DISTRICT



BRAZEAU-ATHABASKA DISTRICT



FOREST BIOLOGY RANGER REPORT

LAC LA BICHE DISTRICT

ALBERTA 1959

by

N.W. WILKINSON

FOREST BIOLOGY LABORATORY

CALGARY, ALTA.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

MARCH, 1960

INTRODUCTION

This report covers Forest Insect and Disease Survey activities in the Lac La Biche District. Survey work began on May 6 and continued until October 3. During this period approximately 7660 miles were travelled by truck on survey work. As an aid to determine the location and amount of aspen defoliation in the District an aerial survey was undertaken. On this survey a triangular route of 750 miles was followed east from Edmonton to the Saskatchewan border, then northwest to Embarras and back to Edmonton. A 200 mile trip by rail was made from Lac La Biche to Waterways. During the field season 251 insect and 22 disease samples were submitted.

Immediately prior to the field season ranger personnel built a ranger cabin at Lac La Biche. During this time a forest tent caterpillar study plot was established one mile east of Lac La Biche.

During the general field season work on a few special projects was carried on. A phenology plot was established at Owl River 25 miles north of Lac La Biche. Spruce seed and data were collected for the Federal Forestry Branch. Throughout the District 22 forest tent caterpillar sequential sample plots were established. After the field season, work on the cabin and grounds was carried on and in company with J. Emond, a forest disease investigation trip was made south of Grande Prairie.

Insect populations were low throughout the District with the exception of forest tent caterpillar and the American aspen beetle whose numbers in some areas ranged from medium to heavy.

Leaf-rollers were responsible for some defoliation of aspen in the extreme south and southeastern sections of the District. This defoliation

ranged from light to moderate except where the American aspen beetle was found in conjunction with leaf-rollers. In these areas damage was usually heavy but occurred only in a few places along Highway 16.

Tree disease outbreaks reported in 1959 included 2 outbreaks of dwarf mistletoe on pine and an area where poplar trees were infected with poplar ink spot.

A parasite of dwarf mistletoe, Wallrothiella arceuthobii (Pk.) Sacc., was found in the District this year for the first time.

TABLE I

SUMMARY OF INSECT CONDITIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	35	Trembling aspen	121
Pine	13	Willow	10
Larch	36	Poplar	11
		Birch	6
Total	84	Total	148
Collections from miscellaneous hosts			19
		Grand total	251

INSECT CONDITIONS

Forest tent caterpillar, Malacosoma disstria Hbn.

In 1959 there was an increase in the abundance of forest tent caterpillar larvae and in the number of areas in which aspen were attacked. Three areas of heavy defoliation by this insect occurred in the Lac La Biche District. The largest of these was approximately 40 miles in length and up to 25 miles in width extending from north of Kehiwin to near Stubno. This appeared to be the merging of a number of small infestations since complete defoliation was not continuous over the entire area. The second largest outbreak occurred between Cold Lake and Marie Lake in an area 8 miles long by 2 miles wide. The third was located 6 miles north of Wandering River Post Office and was 2 miles in diameter. Medium defoliation was found only at the perimeters of the heavily attacked areas. Light defoliation was found from Calling Lake and Wandering River in the northwest to Vegreville and Dewberry in the southeast. Evidence of light defoliation was also found near Athabasca on the western side of the District and at Chard and Beaverdam near the Saskatchewan border.

Observations on weather, the hatching dates and larval survival of the forest tent caterpillar, were made near Lac La Biche during the latter part of April and the month of May.

TABLE II

RESULTS OF SEQUENTIAL SAMPLING

FOREST TENT CATERPILLAR 1959

DEFOLIATION FORECAST FOR 1960

Location	Predicted defoliation 1960	Location	Predicted defoliation 1960
Lac La Biche	not noticeable	Two Hills	not noticeable
Grassland	nil	Andrew	not noticeable
Calling Lake	not noticeable	Stry	nil
Athabasca	not noticeable	Warspite	not noticeable
Rochester	noticeable	Vilna	nil
Ashmont	not noticeable	Brierville	noticeable
Elk Point (N)	noticeable	Wandering River	noticeable
Elk Point (S)	noticeable	Beauvallon	noticeable
Dewberry	noticeable	Ellscott	not noticeable
Vermilion	noticeable	Debolt	not noticeable
Mannville	noticeable		

Larch sawfly, Pristiphora erichsonii (Htg.)

A decline in the abundance of this insect was evident in the portions of the Lac La Biche District that were examined in 1959. Light to moderate defoliation was found in all larch stands examined. Examinations of what appeared to be severe defoliation in some areas proved to be tree mortality.

In some stands unusually short needle growth was evident this year. This condition may have resulted from defoliation in past years causing a decline in tree vigor.

Sequential sampling at the 5 permanent sample stations in the District was again completed and data gathered to determine the infestation classes.

TABLE III

RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLE STATIONS

Station No.	Location	Infestation Class 1958	Infestation Class 1959
5 - 1	Calling Lake	Moderate	Moderate
5 - 2	Perryvale	Light	Severe
5 - 4	Cold Lake	Light	Light
5 - 5	Lac La Biche	Moderate	Light
5 - 6	Speddin	Moderate	Nil

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Severe defoliation occurred in the St. Paul and Lac La Biche areas but only a few trees were affected. Many of the farmers in the District were aware of this sawfly and have been applying sprays to protect their shelterbelts. This spraying program has probably been an important factor in the sharp decline in the numbers of these pests. It was necessary to beat 40 spruce trees in order to collect 200 larvae in an area that in previous years

supported a heavy population. Larvae of this insect were collected in the Nestow-Legal area north of Edmonton, and near Waskatenau, Radway, Fort Saskatchewan, and LaCorey. In these areas the number of larvae and damage caused was negligible.

Aspen defoliators, Pseudexentera improbana oregonana Wlshm., Choristoneura conflictana (Wlk.), Operophtera bruceata (Hulst) and Compsolechia niveopulvella Cham.

Larvae of these insects were responsible for some aspen defoliation in the Lac La Biche District. P. improbana oregonana was primarily responsible for the defoliation which occurred in the southwest corner of the District. This defoliation was heavy around Edmonton gradually decreasing to light at Nestow and Vermilion. Moderate defoliation in small areas occurred at Spedden and Beaverdam. Very light traces of defoliation were found at widely separated points throughout the District from Vermilion in the south to McMurray in the north.

American aspen beetle, Phytodecta americana (Schffr.)

Adults and larvae of this beetle were found feeding on aspen from Mile 28 to Mile 58 north of Lac La Biche along the McMurray Road. At the time of survey defoliation was very light; however, medium defoliation was expected to occur as the larvae matured. Heavy defoliation occurred in the vicinity of Innisfree where late instar larvae were found in an area which had been attacked earlier by leaf-rollers.

Pitch nodule maker, Petrova sp.

This nodule maker was found in all pine stands examined in the District. There appeared to be little effect on the attacked trees other than an occasional stem of regeneration pine which may have been weakened enough to break from wind or snow.

Prairie tent caterpillar, Malacosoma lutescens (N.&D.)

Larvae of this caterpillar were occasionally found in the Lac La Biche District in 1959. Willow and chokecherry were the principal hosts and these trees were completely defoliated. One small area 13 miles north of Plamondin was densely populated with 23 nests in an area 40 feet square. Very low populations were found at widely separated points in the District.

TABLE IV

OTHER NOTEWORTHY INSECTS

(which occurred in the Lac La Biche District, 1959)

Insect species	No. of Coll.	Host	Remarks
Bruce spanworm, <u>Operophtera bruceata</u> (Hulst)	4	Aspen	Found occasionally in conjunction with leaf-tiers.
Eastern larch beetle, <u>Dendroctonus simplex</u> Lec.	1	Larch	Collected east of Lac La Biche.
Gall mite, <u>Eriophyidae</u>	2	Aspen	In evidence throughout the District.
Grey willow leaf beetle, <u>Galerucella decora</u> (Say)	2	Aspen Willow	East of Lac La Biche.
Leaf-eating beetle, <u>Chrysomus</u> sp.	1	Saskatoon	The first time this insect has been collected in Alberta by the Forest Insect Survey.
Scale, <u>Aspidiotus popularum</u> (Marlatt)	2	Aspen	The first time this insect has been collected in Alberta by the Forest Insect Survey.
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	1	White spruce	Found at one location only.

Other noteworthy insects.....continued

Insect species	No. of coll.	Host	Remarks
Striped alder sawfly, <u>Hemichroa crocea</u> Geoffroy	2	Speckled alder	Heavy defoliation east of Goodrich and Athabasca.
Twice-stabbed lady beetle, <u>Chilocorus stigma</u> Say.	2	Aspen	Collected in a stand of aspen that is infested with <u>A. popularum</u> .

DISEASE CONDITIONS

Dwarf mistletoe, Arceuthobium americanum (Nutt. ex Englem.)

This parasitic plant of pine was found in all stands of Jack pine examined in the Lac La Biche District. The area most severely attacked was 60 miles north of Lac La Biche where an estimated 75 per cent of the pine was affected. This area had been burned over 10 or more years previously, leaving islands of mature pine which have become heavily infected. The regeneration in the area is less heavily infected.

Other areas infected were; 23 miles north of Lac La Biche, 13 miles east of Goodrich, 8 miles east of Smoky Lake and 14 miles northwest of Philomena.

The hyperparasite Wallrothiella arceuthobii (Pk.) Sacc. was found on A. americanum 23 miles north of Lac La Biche.

Poplar ink spot, Sclerotium confundens Whet.

Discoloration of aspen leaves by this disease was very noticeable within a 30 mile radius of Lac La Biche. An estimated 30 per cent of the leaves were affected on 10 per cent of the aspen. In some cases the attack was heavy enough to give the tree a scorched appearance.

Stem rust of pine, Cronartium commande Peck.

The detection of this disease at 3 locations in the Lac La Biche District has extended the known distribution range of the disease. Twenty-eight miles north of Lac La Biche the canker was found on the stem of a Jack pine. Fifty-four miles north of Lac La Biche and 10 miles south of Calling Lake cankers were found on the branches of this tree species. At these 3 locations the infected areas were small.

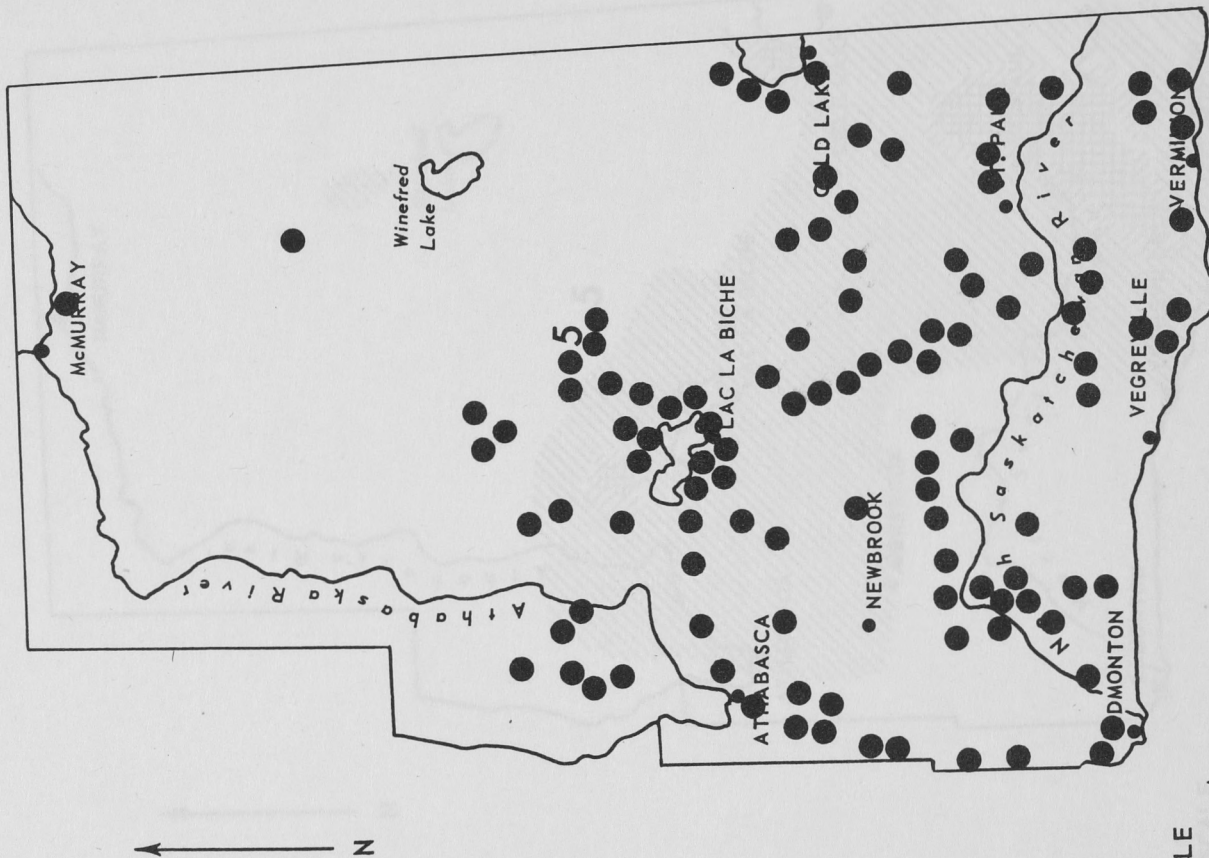
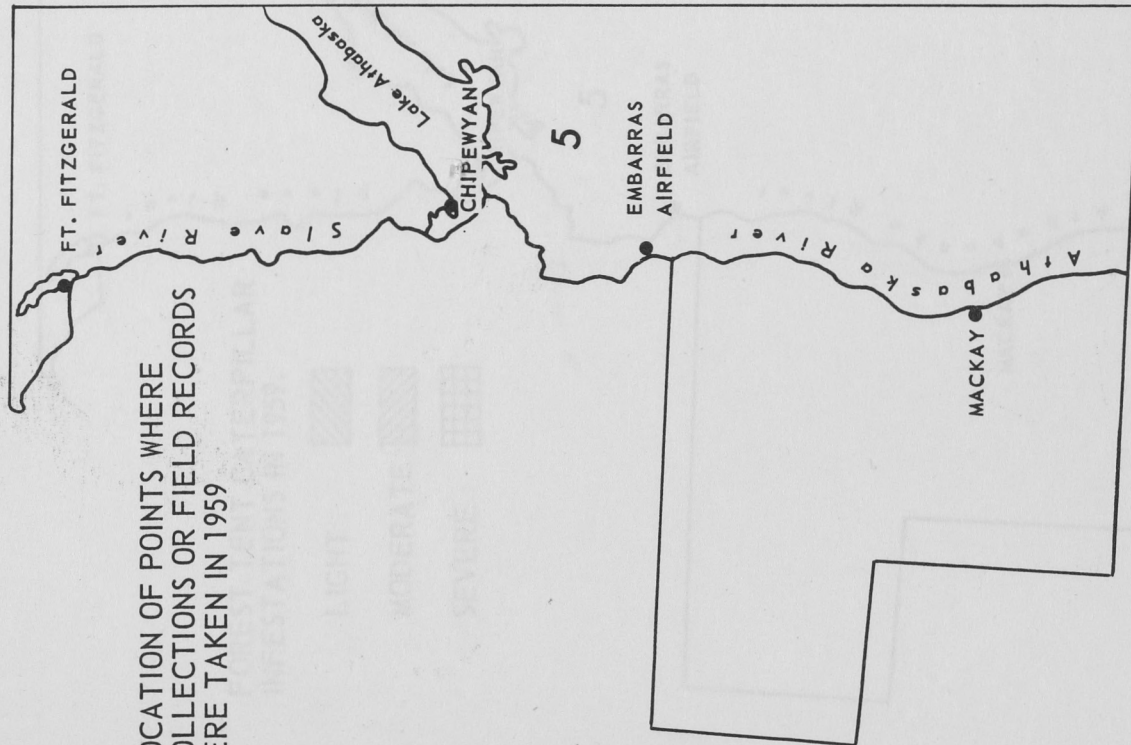
Rust on spruce, Peridermium coloradense (Dist) A.&K. and Chrysomyxa ledi (A.&S.) De Bary.

The former of these diseases has caused brooms to develop on black spruce in Elk Island National Park and in the area around Lac La Biche. The trees attacked do not appear to have suffered from this rust as in most cases only one branch was diseased.

C. ledi was found on black spruce needles in a small area near Smoky Lake.

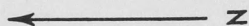
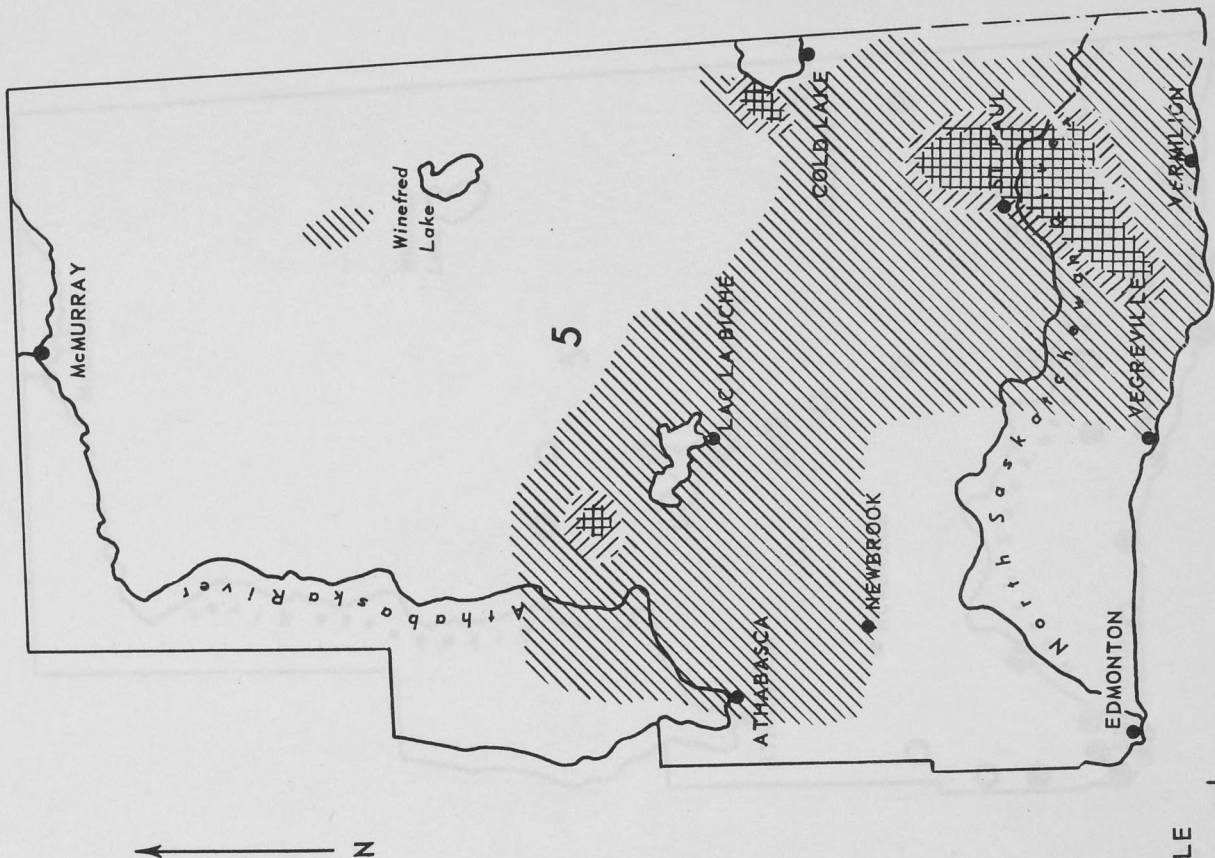
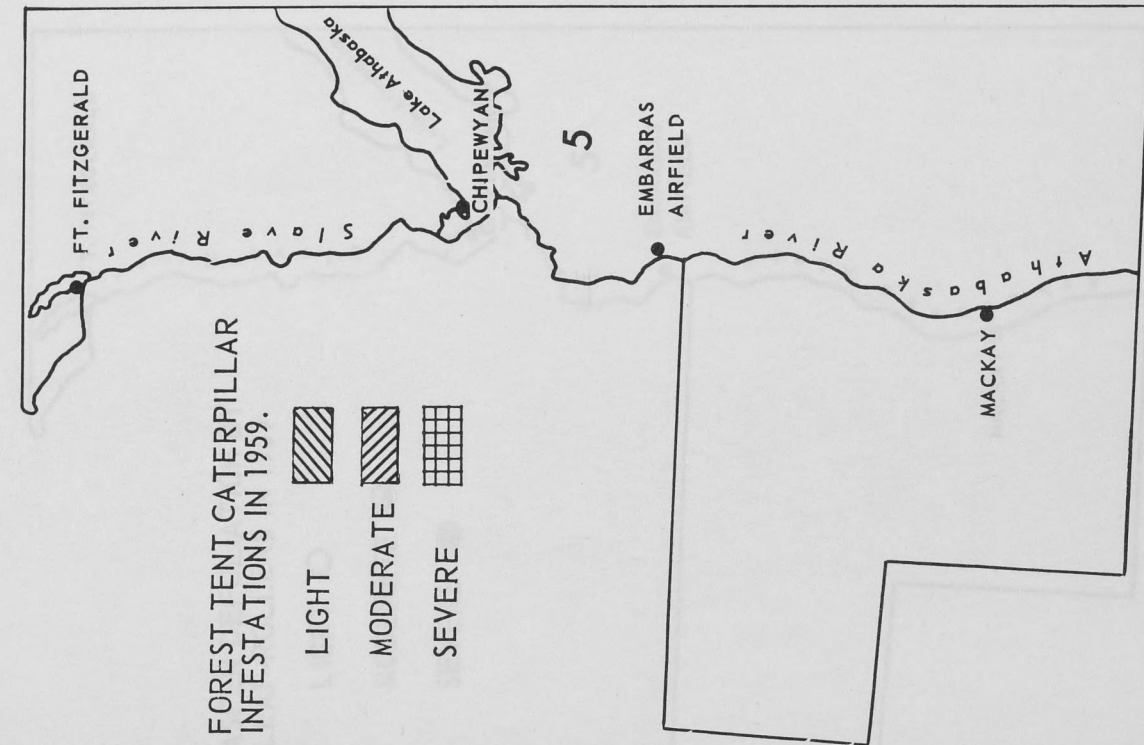
Apiosporine collinsii (Schw.) Von Hohnel.

Clumps of saskatoon leaves infected by this disease agent were observed 2 miles west of Lac La Biche and 7 miles north of Elk Point. The condition appeared to occur only where a heavy overstory shaded the saskatoon bushes.



SCALE
0 35 MILES

LAC LA BICHE DISTRICT

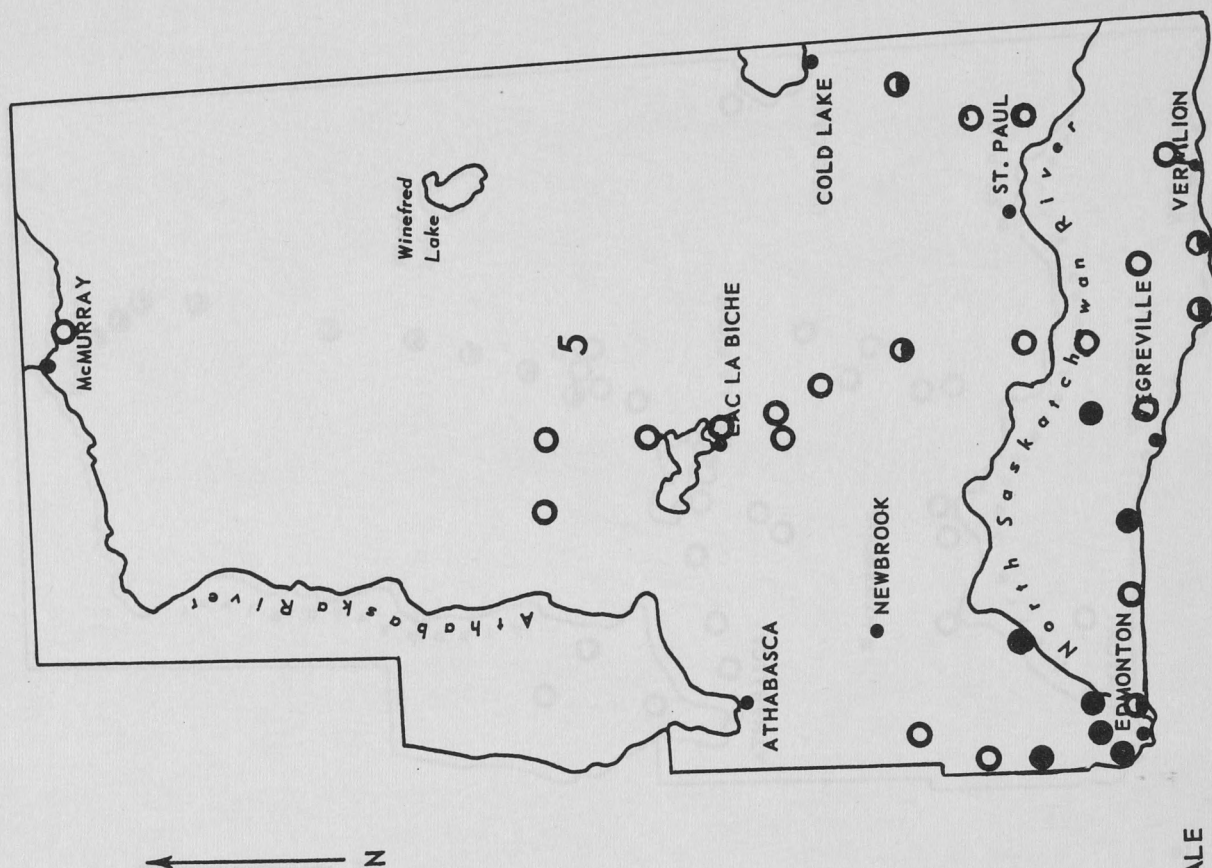
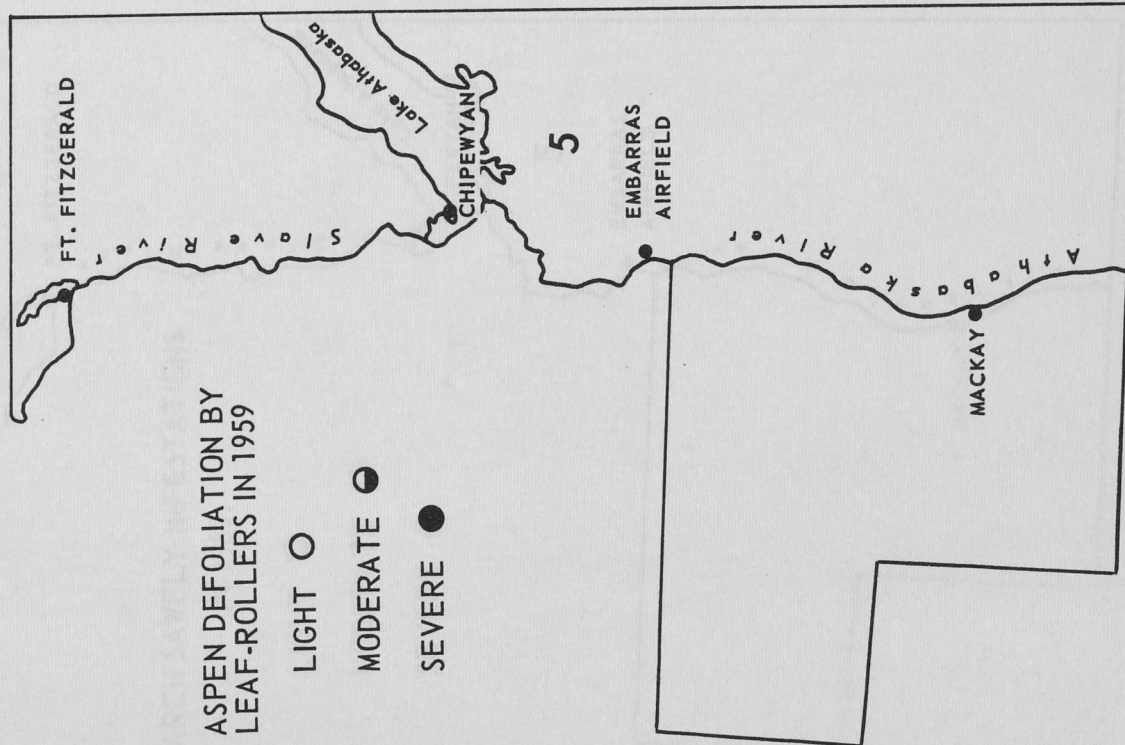


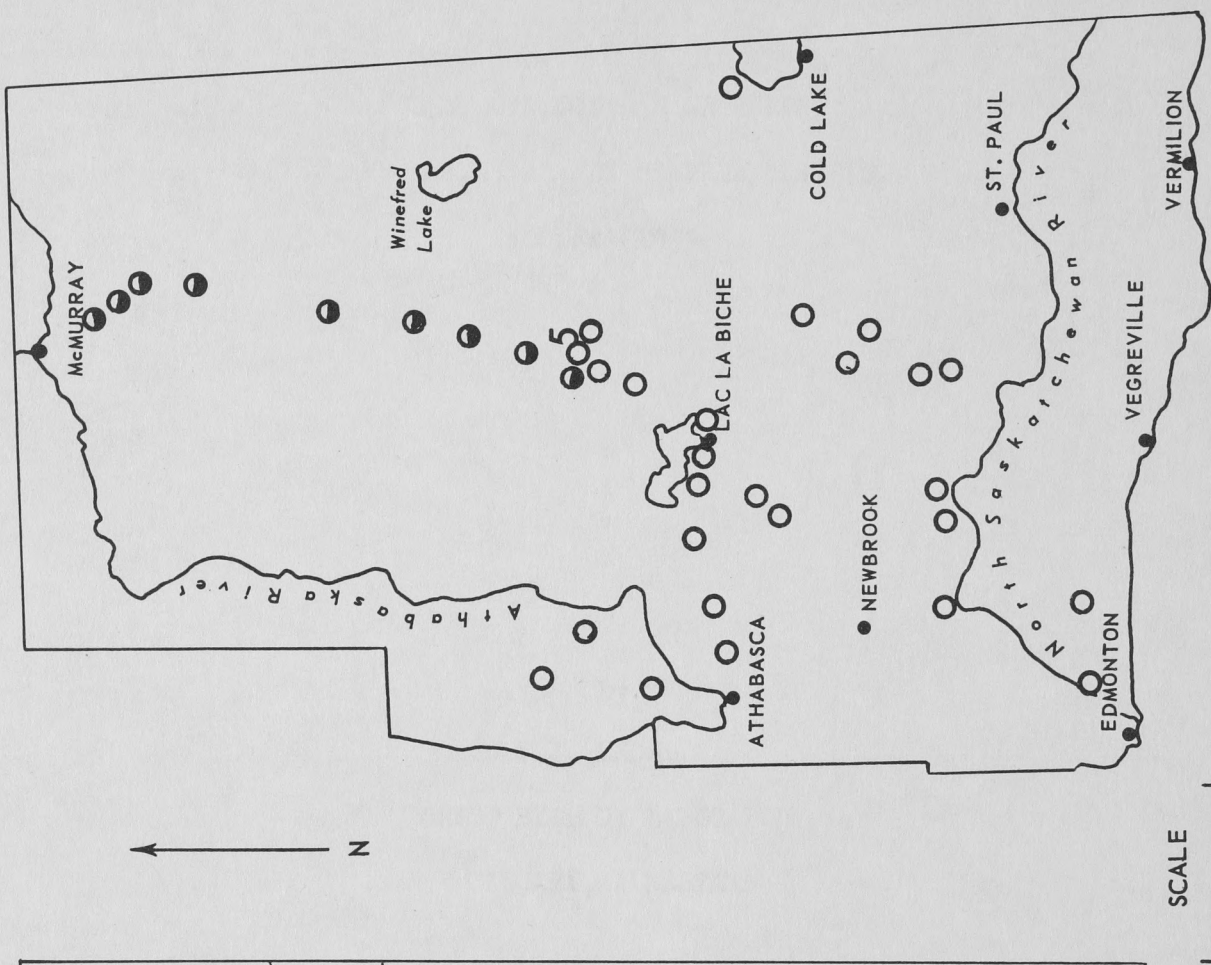
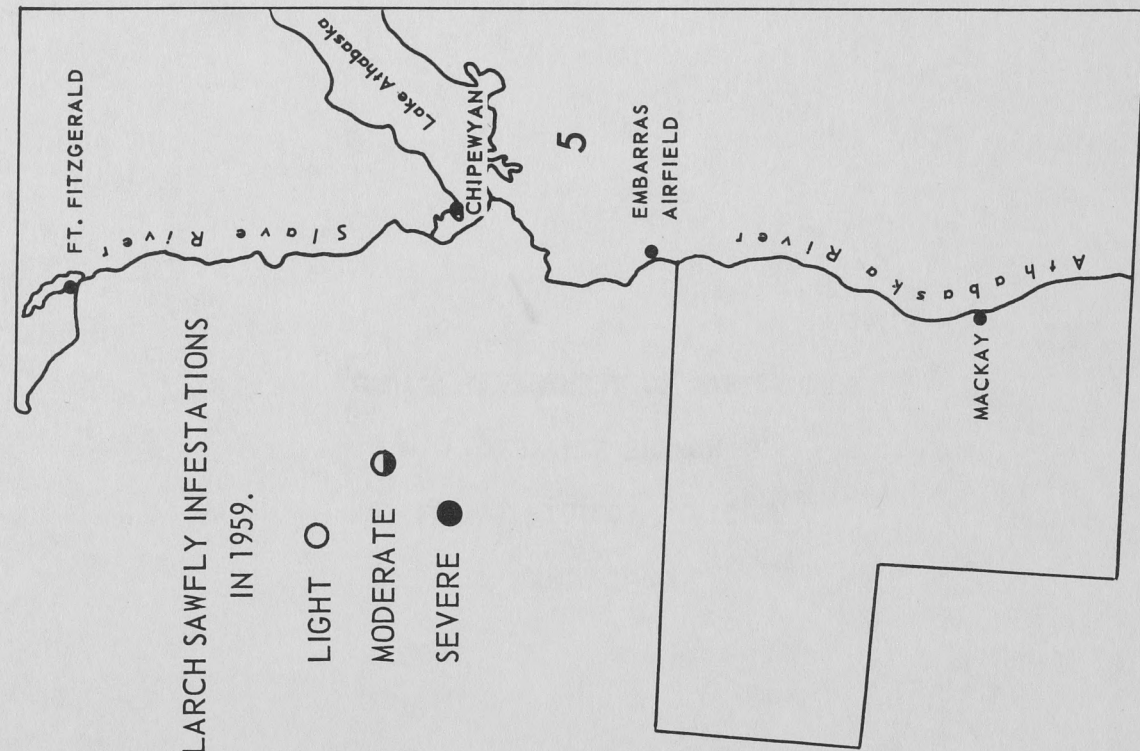
SCALE
0 35 MILES

LAC LA BICHE DISTRICT

ASPEN DEFOLIATION BY LEAF-ROLLERS IN 1959

- LIGHT ○
- MODERATE ◐
- SEVERE ●





LAC LA BICHE DISTRICT

FOREST BIOLOGY RANGER REPORT
SLAVE LAKE - GRANDE PRAIRIE DISTRICT
ALBERTA 1959

by
F.J. EMOND
FOREST BIOLOGY LABORATORY
CALGARY, ALBERTA

CANADA DEPARTMENT OF AGRICULTURE
RESEARCH BRANCH
FOREST BIOLOGY DIVISION
MARCH 1960

INTRODUCTION

The Forest Biology Survey in the Slave Lake - Grande Prairie District was carried out from May 24 to September 24. During this period a total of 12,000 miles was travelled by truck and approximately 560 miles by aircraft. A total of 303 insect samples and 8 tree disease samples were submitted.

Prior to the field season assistance was given in the construction of the new Forest Biology cabin at Lac La Biche. Additional time was spent on the same project at the conclusion of the field season.

Aerial surveys were carried out in District 6 during the months of June and August. The purpose of these surveys was to map the defoliation caused by the forest tent caterpillar and the larch sawfly respectively.

General weather and road conditions during the survey season were for the most part favorable. During the month of August rain showers were frequent, leaving most side roads in an unfavorable condition for travel.

Special projects and investigations carried out during the season included; sequential sampling of 4 permanent larch sawfly plots, sequential sampling of aspen for tent caterpillar egg masses, mass collections of 200 larvae of the tent caterpillar and of the yellow-headed spruce sawfly for parasite studies, the annual re-examination of Federal Forestry seed plots and the establishment of pine phenology plots at Smith and Grovedale.

Three species of insects were responsible for increased aspen defoliation during the 1959 season. These were the forest tent caterpillar, the

Grand Total 303

Bruce spanworm and a leaf-tier, Pseudexentera improbana oregonana Wlshm.

The forest tent caterpillar was largely responsible for defoliation of aspen in the Sturgeon Lake, Wapiti, Woking and Fawcett Lake areas. The Bruce spanworm and Pseudexentera combined, were responsible for damage to aspen near Sexsmith, Woking, Spirit River, Hythe and Beaverlodge.

The larch sawfly was again active during 1959 and defoliation was extensive in the eastern half of the District, with most of the damage contained in the Slave Lake Forest Division. In the western half of the District, the Grande Prairie Forest Division, damage remained negligible.

No extensive new outbreaks of tree diseases were reported from the District during 1959. Reports of Atropellis canker on lodgepole pine and dwarf mistletoe on jackpine south of Grande Prairie were investigated. Cone rust was prevalent on white spruce cones in the same area, affecting approximately 10 to 20 per cent of the cone crop. Evidence of cone rust was also recorded at Wabasca Lake.

TABLE I

SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. coll.	Deciduous hosts	No. coll.
Spruce	38	T. aspen	136
Pine	11	Willow	30
Larch	27	Poplar	14
Fir	4	Birch	7
Total	80	Total	187
Collections from miscellaneous hosts			36
Grand Total			303

INSECT CONDITIONS

Forest tent caterpillar, Malacosoma disstria Hbn.

Defoliation of aspen by larvae of this species was extensive in the western part of the District. Heavy defoliation was very much in evidence along Highway 34 between Sturgeon Lake and Bezanson. In the Sturgeon Lake area complete stripping of aspen occurred as well as most of the understory of rose, raspberry, sheperdia, cranberry and willow. Heavy defoliation was also recorded south of Sturgeon Lake for a distance of 20 to 25 miles and extended westward for 55 to 60 miles to a line immediately east of the settlement of Wapiti. The mapping of this infestation which covered approximately 1450 square miles was completed by aerial survey in the latter part of June.

Small pockets of heavy defoliation were also reported from Woking and south of Fawcett Lake. Larvae or cocoons were found in the majority of aspen stands inspected throughout the remainder of the District but only light damage was evident.

In a mass collection of 200 larvae collected from the Crooked Creek area for parasite studies, both polyhedral and capsule virus diseases were found. During the latter part of July numerous dead larvae were observed in this area.

It is believed that these diseases contributed largely to the rapid decline of the infestation by this species which occurred in central Alberta between 1951 and 1953.

TABLE II
RESULTS OF SEQUENTIAL SAMPLING
FOREST TENT CATERPILLAR 1959
DEFOLIATION FORECAST FOR 1960

Location	Predicted defoliation 1960	Location	Predicted defoliation 1960
Sturgeon Lake	noticeable	Demmitt	nil
High Prairie	nil	Baytree	nil
Driftpile	not noticeable	Spirit River	nil
Slave Lake	nil	Tangent	not noticeable
Fawcett Lake	noticeable	Grovedale	noticeable
Huallin	not noticeable		

Larch sawfly, Pristiphora ericksonii (Htg.)

Population levels of this species remained much the same as in the previous season.

Defoliation in the Canyon Creek, Slave Lake and Fawcett areas remained in the light to moderate category with small patches of heavy defoliation reported from the Flatbush and Smith vicinities. Most of the damage was confined to the mid and upper crown of trees 3 to 6 inches DBH.

An aerial survey was carried out in the Wabasca, Graham, Utikuma and Fawcett lakes area during the latter part of August and early September to map the distribution of and the damage caused by larch sawfly in areas inaccessible by truck. Light to moderate damage was evident over most of the territory covered. Between Martin Tower and Fawcett Lake and northeast of Wabasca and Peerless Lakes small pockets of heavy defoliation were observed.

In the western part of the District damage remained light and of little immediate concern.

TABLE III
RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLE PLOTS

Station No.	Location	Infestation class 1958	Infestation class 1959
6 - 1	Grande Prairie	Light	Light
6 - 2	Flatbush	Moderate	Moderate
6 - 3	Slave Lake	Moderate	Moderate
6 - 4	Grouard	Light	Light

Aspen defoliators, Bruce spanworm, Operophtera bruceata (Hulst) and a leaf-tier, Pseudexentera improbana oregonana Wlshm.

The combination of these 2 species caused considerable defoliation throughout the western half of the District. Moderate to heavy damage to aspen was reported between Woking and Sexsmith along both sides of Highway 2. Heavy populations of larvae were also reported in the Smith, Jarvie, Wembley, Bonanza and Gordondale areas. Defoliation, although extensive in these areas, was scattered and was confined to small patches of approximately 2 to 6 acres.

Elsewhere throughout the District population levels were low and as a result defoliation was negligible.

The large aspen tortrix, Choristoneura conflictana (Wlk.)

A small outbreak of this species was reported 5 miles northwest of

Smith for approximately 4 miles along Highway 2. It was difficult to determine the exact amount of defoliation caused by this insect due to the presence of another defoliator, the forest tent caterpillar, at the same location. These 2 species were responsible for moderate to heavy damage in the described area.

A further examination of this area will be made during the 1960 season to determine the proportion of the species present in this population.

Western tent caterpillar, Malacosoma pluviale (Dyar)

There was a decided increase in larval populations of this species of tent caterpillar during the 1959 season. Defoliation of rose, saskatoon and, occasionally raspberry was reported in the Flatbush, Sexsmith, Teepee Creek, Rycroft and Saskatoon Lake areas. The heaviest concentration occurred in the Saskatoon Lake area, where both rose and saskatoon were heavily defoliated.

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

A noticeable decrease in population levels of this species was reported throughout the District during 1959. Light damage to shelterbelt and ornamental trees was in evidence in the Grande Prairie and Valleyview districts. In the remainder of District 6 few larvae were collected and damage was negligible.

A small outbreak of this species reported in the spruce shelterbelts north of Valleyview in 1958 has subsided. An attempt to collect 200 larvae for parasite study from this area yielded only 30 larvae at one of these locations. Spraying of these shelterbelts with insecticides is believed to be partially responsible for the decline in populations of this insect.

Spruce spider mite, Oligonychus ununguis (Jac.)

Damage caused by this spider mite was again evident in the majority of shelterbelt and ornamental spruce inspected. Webbing and discoloration of needles was noted in the Valleyview, Grande Prairie, High Prairie and Driftpile areas.

The heavy infestation reported at Widewater in 1958 has subsided and no damage to any extent was observed in that area during the 1959 season.

Spruce gall aphids, Adelges sp.

An increase of these gall forming aphids was noted throughout the District during 1959. Collections were made from both black and white spruce in the Grouard, Wabasca, Wanham, Grande Prairie and Valleyview areas.

Alder leaf miner, Gracilariidae

Larvae of these leaf miners were the cause of considerable defoliation and discoloration of alder stands throughout the District. Heavy concentrations of larvae were in evidence at the following locations: along Highway 34 near the Smoky River bridge, on the banks of the Little Smoky River 12 miles south of Triangle and 35 miles south of Grovedale in the Cutbank River Valley. Low populations were also present in the Goodwin, Grouard and Slave Lake areas.

Grey willow leaf beetle, Galerucella decora (Say)

Adults and larvae of the grey willow leaf beetle were found at the following locations: Sexsmith, Hythe, Demmitt, Grouard, Slave Lake and south of Utikumasis Lake.

The largest populations were recorded in the Lesser Slave Lake area where light to moderate injury to aspen and willow occurred. Elsewhere damage was negligible.

TABLE IV

OTHER NOTEWORTHY INSECTS

(which occurred in the Grande Prairie-Slave Lake District, 1959)

Insect species	No. of coll.	Host	Remarks
Aphids	6	All species	Observed throughout the District, noticeable increase on aspen.
Birch skeletonizer, <u>Bucculatrix canadensisella</u> Chamb.	1	Birch	Noticeable decrease in population level. No damage observed.
A ground beetle, <u>Calasoma frigidum</u> Kby.	1	T. aspen	Observed feeding on <u>Pseudexentera improbana oregonana</u> in the Wembley and Woking areas.
Leaf-eating beetles, <u>Chrysomelidae</u>	8	T. aspen Alder Willow	Found at various locations throughout the District. Little damage reported.
A gall mite, <u>Eriophyidae</u>	1	T. aspen	Heavy populations in the Leicester district north of High Prairie.
Bark beetles, <u>Ips</u> sp.	2	W. spruce	Found mostly on slash and cut logs, few samples taken.
A looper, <u>Itame loricaria</u> Evers.	13	T. aspen	Associated in various numbers with other aspen defoliators.
Poplar gall aphids, <u>Pemphigus</u> spp.	6	B. poplar	Fairly common on poplar throughout the District.
A pitch nodule maker, <u>Petrova</u> sp.	2	J. pine L. p. pine	Found mainly where young pine stands occur.

Other noteworthy insects.....continued

Insect species	No. of coll.	Host	Remarks
Poplar serpentine miner, <u>Phylloconistis populiella</u> Chamb.	3	T. aspen	Noticeable increase in populations; scattered throughout the District.
Green spruce looper, <u>Semiothisa granitata</u> Gn.	5	W. spruce	Collected from spruce during late August and early September.

DISEASE CONDITIONS

Cone rust on spruce, Chrysomyxa pyrolae (DC.) Rostr.

Rust on spruce cones was found in the majority of cone crops inspected throughout the District. Samples were taken from Wabasca and from the Grande Prairie lumber berth south of Grovedale. In a cone sample taken from 3 trees, approximately 10 to 20 per cent of the cone crop was affected by this organism.

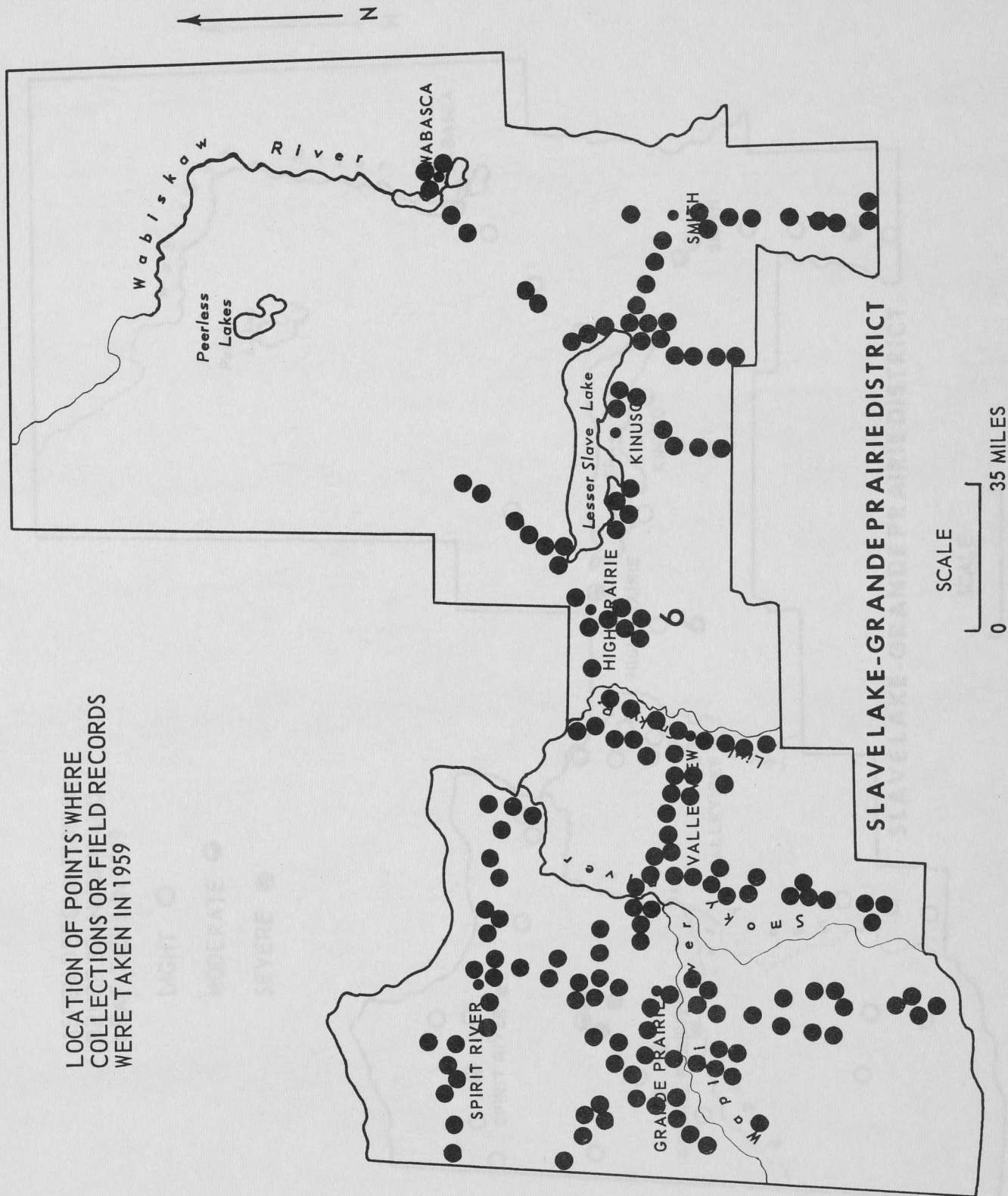
Stem rust of pine, Cronartium harknessii (Moore) Meinecke.

This stem rust was found on jack pine in 2 locations in the District. These locations were: 2 miles west of Demmitt and 22 miles south of Slave Lake along the Swanson Lumber road.

Canker of pine, Atropellis piniphila (Weir) Lohman and Cash.

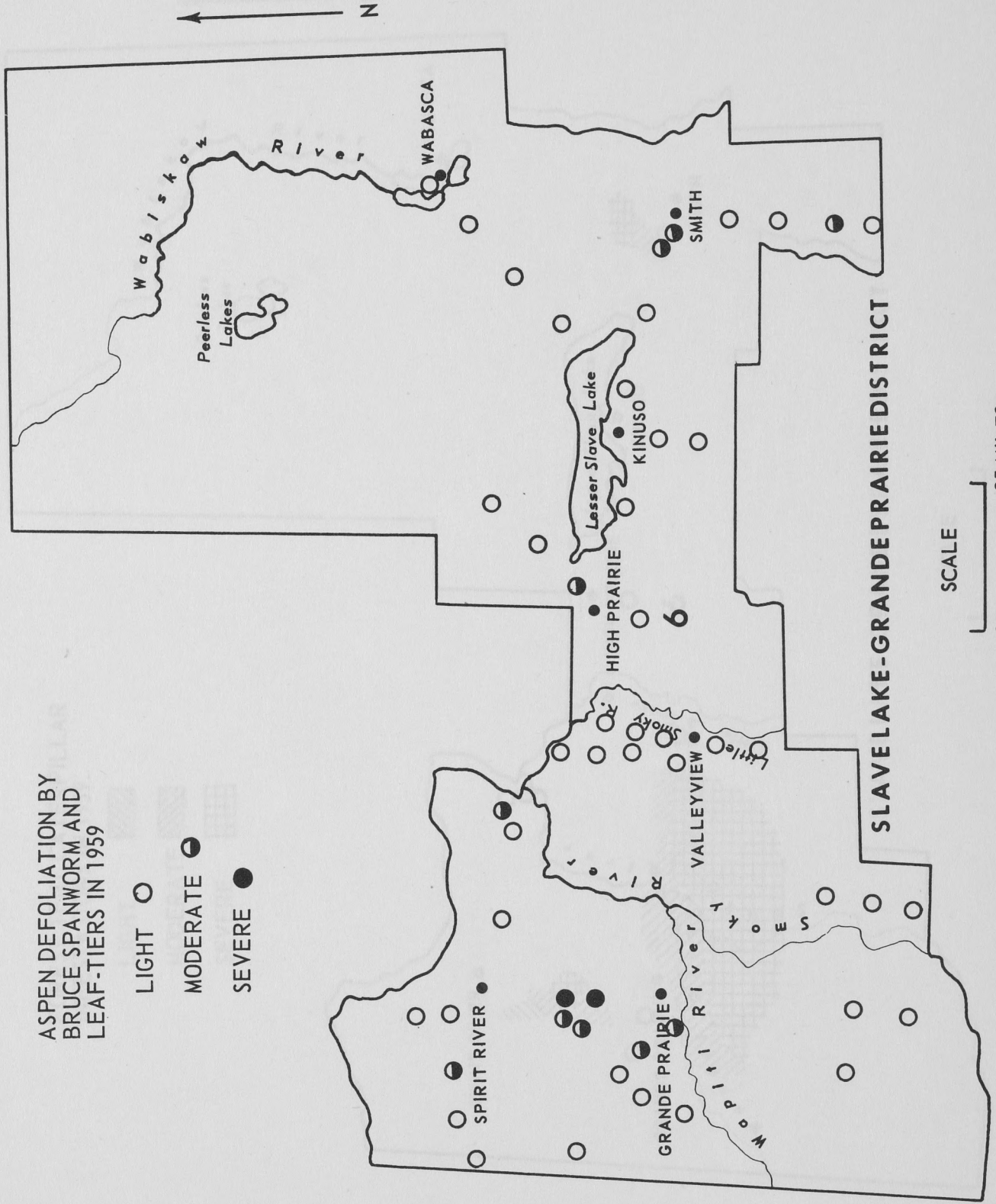
Investigations made during the latter part of the season revealed the presence of this disease in the lodgepole pine stands south of Grande Prairie. Due to the lateness of the season and prevailing weather conditions no determination could be made of the intensity or area affected by this disease. Further investigation will be made during the 1960 field season.

LOCATION OF POINTS WHERE
COLLECTIONS OR FIELD RECORDS
WERE TAKEN IN 1959

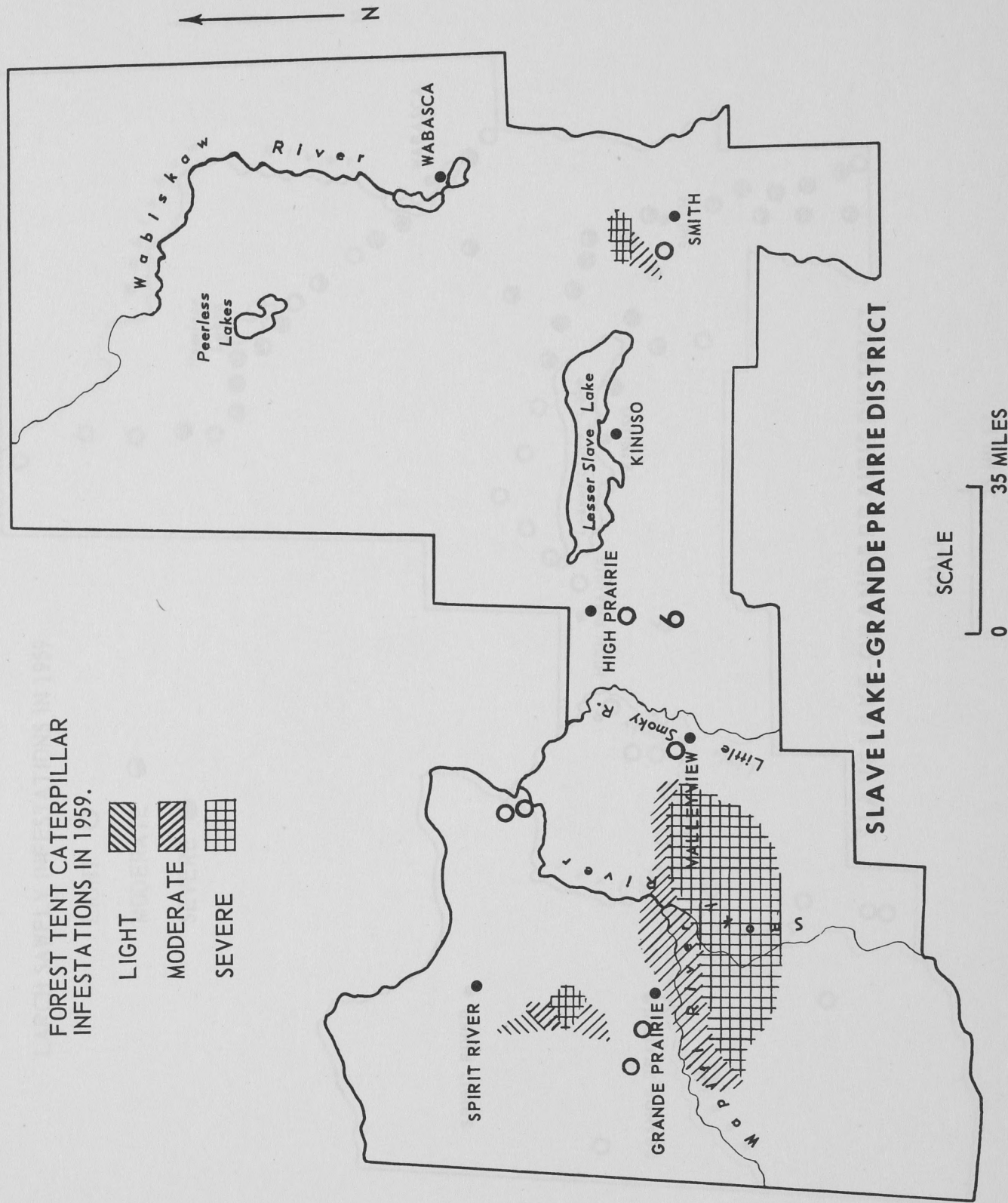
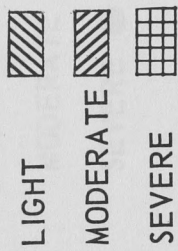


ASPEN DEFOLIATION BY
BRUCE SPANWORM AND
LEAF-TIERS IN 1959

- LIGHT ○
MODERATE ◐
SEVERE ●

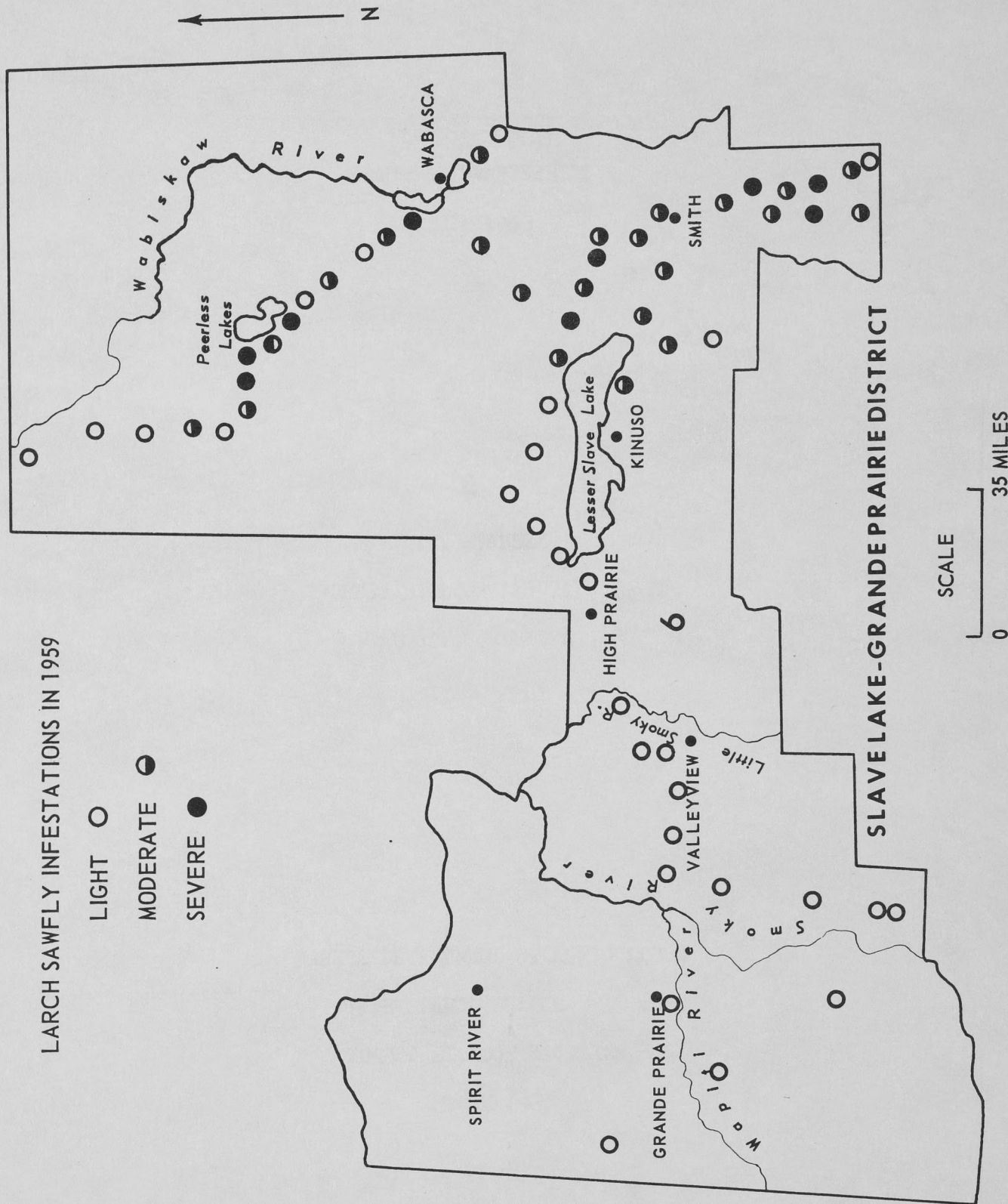


FOREST TENT CATERPILLAR
INFESTATIONS IN 1959.



LARCH SAWFLY INFESTATIONS IN 1959

- LIGHT ○
- MODERATE ◐
- SEVERE ●



FOREST BIOLOGY RANGER REPORT

PEACE RIVER DISTRICT

ALBERTA 1959

by

R.R. STANLEY

FOREST BIOLOGY LABORATORY

CALGARY, ALBERTA

CANADA DEPARTMENT OF AGRICULTURE

RESEARCH BRANCH

FOREST BIOLOGY DIVISION

MARCH 1960

INTRODUCTION

This report covers Forest Insect and Disease Survey activities in the Peace River District. Survey work began on May 20 and continued until September 30. During this period 137 insect and 4 disease samples were submitted. During the field season approximately 5400 miles were flown on aerial surveys, 10,000 miles travelled by truck and 50 miles by canoe on survey work.

The dry weather in spring and early summer was favorable for survey work but during the late summer and fall, rain and snow hindered activities considerably. Three aerial surveys were conducted during the season. The first was in late June for purpose of locating areas where aspen defoliation occurred. The second, in mid-August, was carried out in the Northwest Territories to investigate reports of a new outbreak of spruce budworm, to check on older outbreaks of spruce budworm and to record any changes in the larch sawfly outbreak. The third, at the end of August, was to survey the larch sawfly outbreak in the northwestern part of Alberta.

Sequential sampling in larch sawfly plots was carried out during the last 2 weeks in September. One phenology plot was established at Peace River and 5 sequential sampling plots were set up to obtain information on the forest tent caterpillar outbreak.

There was some extension of heavy defoliation along the northwestern side of the larch sawfly outbreak, a very noticeable increase in forest tent caterpillar populations and a slight decrease in the number of shelterbelts affected by the yellow-headed spruce sawfly.

There were no new outbreaks of tree diseases recorded.

TABLE I

SUMMARY OF INSECT COLLECTIONS BY HOST TREES

Coniferous hosts	No. of Coll.	Deciduous hosts	No. of Coll.
Spruce	28	Aspen	62
Pine	8	Poplar	9
Larch	13	Willow	3
Total	49	Total	74
Collections from miscellaneous hosts			14
Grand Total			137

INSECT CONDITIONS

Larch sawfly, Pristiphora erichsonii Htg.

The larch sawfly outbreak in District 7 remained much the same as in the previous year except for some extension along the northwestern side in the Wabasca-Ft. Vermilion area. This outbreak has gradually spread westward and northward during the past few years until at present defoliation is almost continuous throughout the eastern half of the District. Patches of heavy defoliation were observed up to 30 miles west of the Wabiskaw River, where only light defoliation occurred in 1958, and in the area immediately south of Ft. Vermilion. Light defoliation extended to within a few miles of the Peace River. The presence of these larvae was noted along the Mackenzie Highway from Grimshaw to Meander River in low numbers, except between Grimshaw and Manning where small patches of larch were moderately defoliated.

Severe frost damage throughout this area made it difficult to estimate the damage caused by the larch sawfly.

TABLE II
RESULTS OF SEQUENTIAL SAMPLING
LARCH SAWFLY PERMANENT SAMPLE PLOTS

Station No.	Location	Infestation class 1958	Infestation class 1959
7 - 1	Grimshaw	Light	Light
7 - 2	Keg River	Light	Light
7 - 3	High Level	Light	Light
7 - 4	Watino	Heavy	Moderate
7 - 5	Clear Prairie	Moderate	Light

Forest tent caterpillar, Malacosoma disstria Hbn.

There was an increase in forest tent caterpillar populations in the southern part of the District. In 1958 the only heavy defoliation that occurred was in a small patch south of Donnelly, but in 1959 small infestations were found in the Peace River, Nampa, Donnelly, Falher, Dixonville and Grimshaw areas. These outbreaks were not more than one section in size. After the aspen in these areas was completely stripped, the larvae caused heavy defoliation to understory such as willow and rose. There were a few small outbreaks in the central and northern parts of the District, the largest of which was north of Dixonville where light to heavy defoliation was observed along the roadside for a distance of 10 miles. At Keg River, where in the previous year light to moderate defoliation was reported, there were very few larvae taken in samples. It is believed that late frosts in May accounted for this decline in population.

A small outbreak causing light defoliation was recorded 12 miles southwest of Ft. Vermilion. Another small outbreak was recorded 26 miles southwest of Ft. Vermilion where defoliation was heavy.

TABLE III
RESULTS OF SEQUENTIAL SAMPLING
FOREST TENT CATERPILLAR 1959
DEFOLIATION FORECAST FOR 1960

Location	Predicted defoliation 1960
Whitelaw	noticeable
Peace River	noticeable
Dixonville	not noticeable
Manning	not noticeable
McLennan	nil

Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Defoliation of ornamental and shade spruce trees was found in many areas throughout the agricultural districts. In most cases the property owners had already sprayed the affected trees or were in the process of doing so. The following are locations where spruce sawfly was present and either samples or reports were submitted; Falher, Peace River, McLennan, 8 miles northeast of Peace River, 8 miles south of Falher, and 7 miles south of Girouxville.

Western tent caterpillar, Malacosoma pluviale (Dyar)

These insects caused light to moderate defoliation of rose, choke-cherry and other small shrubs along the river valley from Peace River to Dunvegan. The outbreaks were widely scattered and confined to small patches of not more than 4 or 5 acres. In an area 8 miles north of Cherry Point, heavy defoliation of rose and small shrubs resulted from feeding by these caterpillars, and damage was continuous for a distance of 6 miles along the roadside.

Gall mite, Eriophyidae

Clumping of aspen leaves caused by these insects was widespread in 1959. Damage was light in most areas, except east of Peace River where moderate damage resulted. In all areas affected most of the damage was confined to the smaller open-grown trees. There was no report of these insects causing damage previous to this, so it is believed there was a general build-up of populations in all districts.

Bruce spanworm, Operophtera bruceata (Hulst.)

Small, scattered patches of light defoliation of aspen were present in the vicinity of the Clear Hills Lookout Tower, and extended southwest to Clear Prairie. These insects were not as numerous in this area as in the previous year.

Flea beetle, Altica populi Brown.

At Mile 240 on the Mackenzie Highway these insects were found causing heavy damage to balsam poplar in an area of approximately 2 acres. They were on the small open-grown trees only.

OTHER NOTEWORTHY INSECTS

(which occurred in the Peace River District, 1959)

Insect species	No. of coll.	Host	Remarks
Black-headed budworm, <u>Acleris variana</u> (Fern.)	4	W. spruce	Low populations throughout District.
Large aspen tortrix, <u>Choristoneura conflictana</u> (Wlk.)	2	Aspen	Small patches of light defoliation south of Ft. Vermilion.
Leaf tier, <u>Pseudexentera improbana oregonana</u> Wlshm.	6	Aspen	Low populations throughout District.
Poplar serpentine miner, <u>Phylloconistis populiella</u> Chamb.	5	Aspen	Low populations throughout District. Small area moderately affected at Mile 281, Mackenzie Highway.
Spruce budworm, <u>Choristoneura fumiferana</u> (Clem.)	2	W. spruce	Slight build up of populations near N. W.T. boundary.

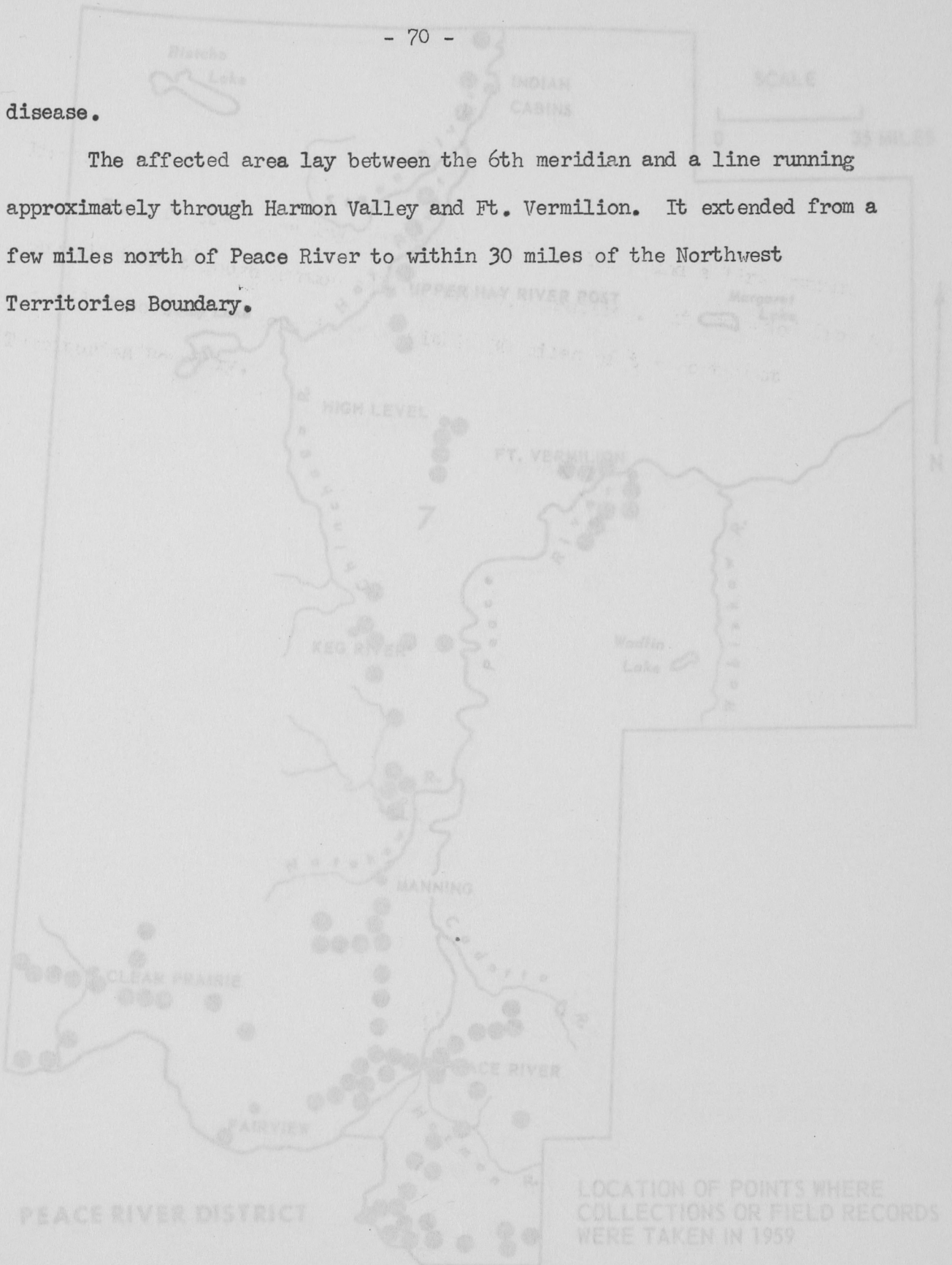
DISEASE CONDITIONS

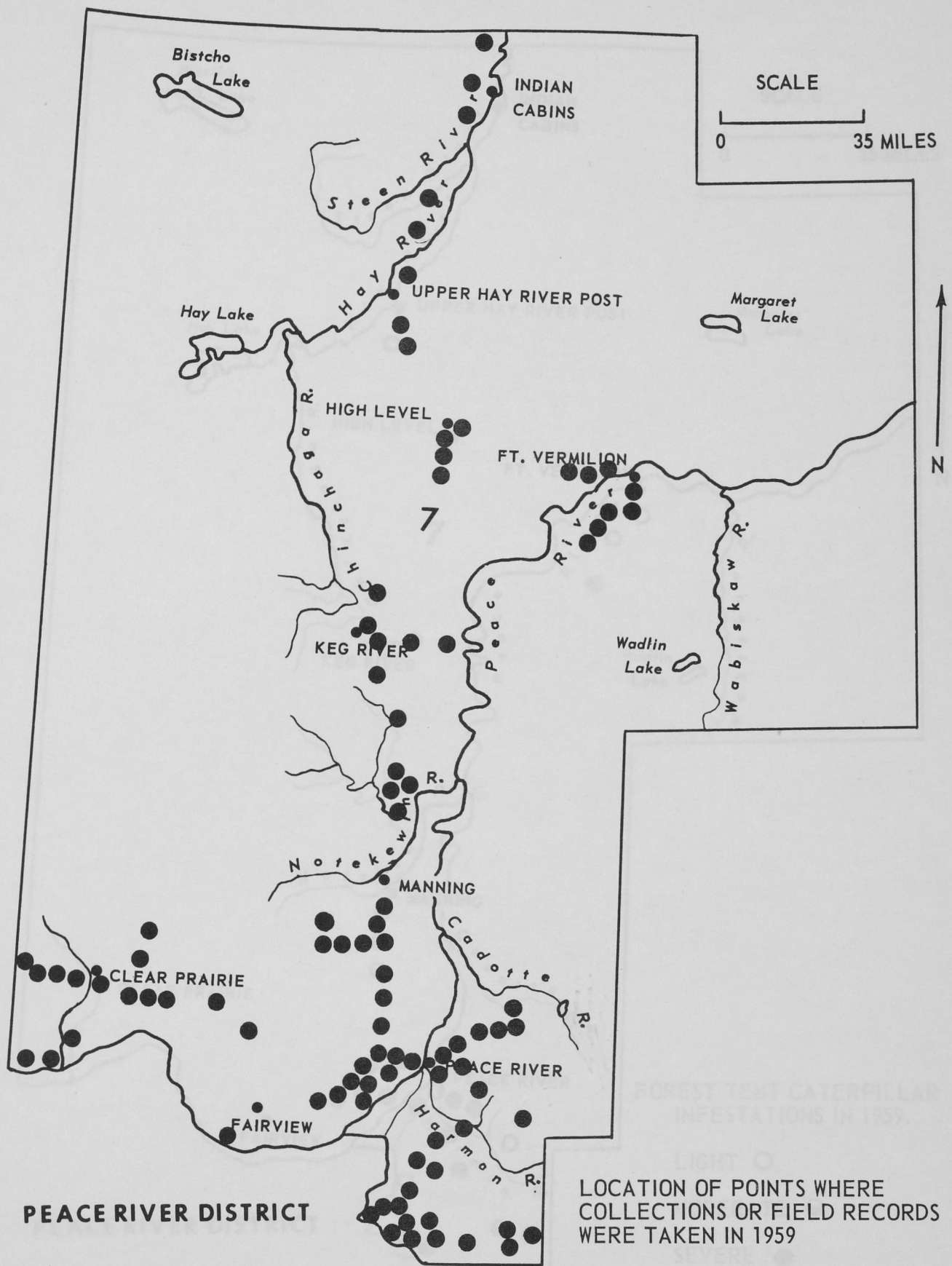
Weather damage

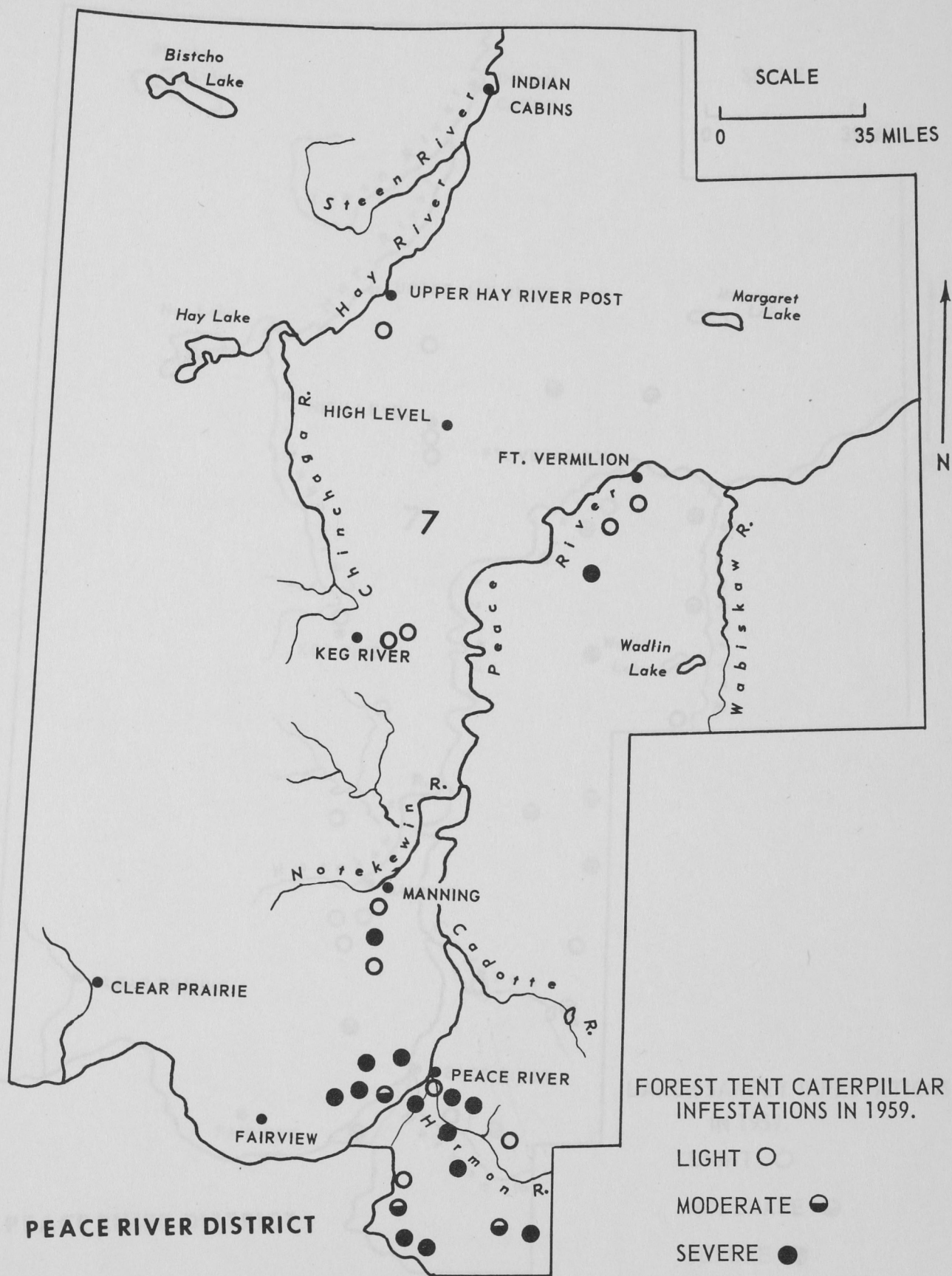
Damage to larch and aspen stands throughout most of the area north of Peace River was evident in 1959. The reason for this damage was not definitely established but it is believed to be the result of a severe frost in May which killed the new growth shortly after it budded out. Several twig samples were sent to the laboratory at Seebe but there was no evidence of insects or

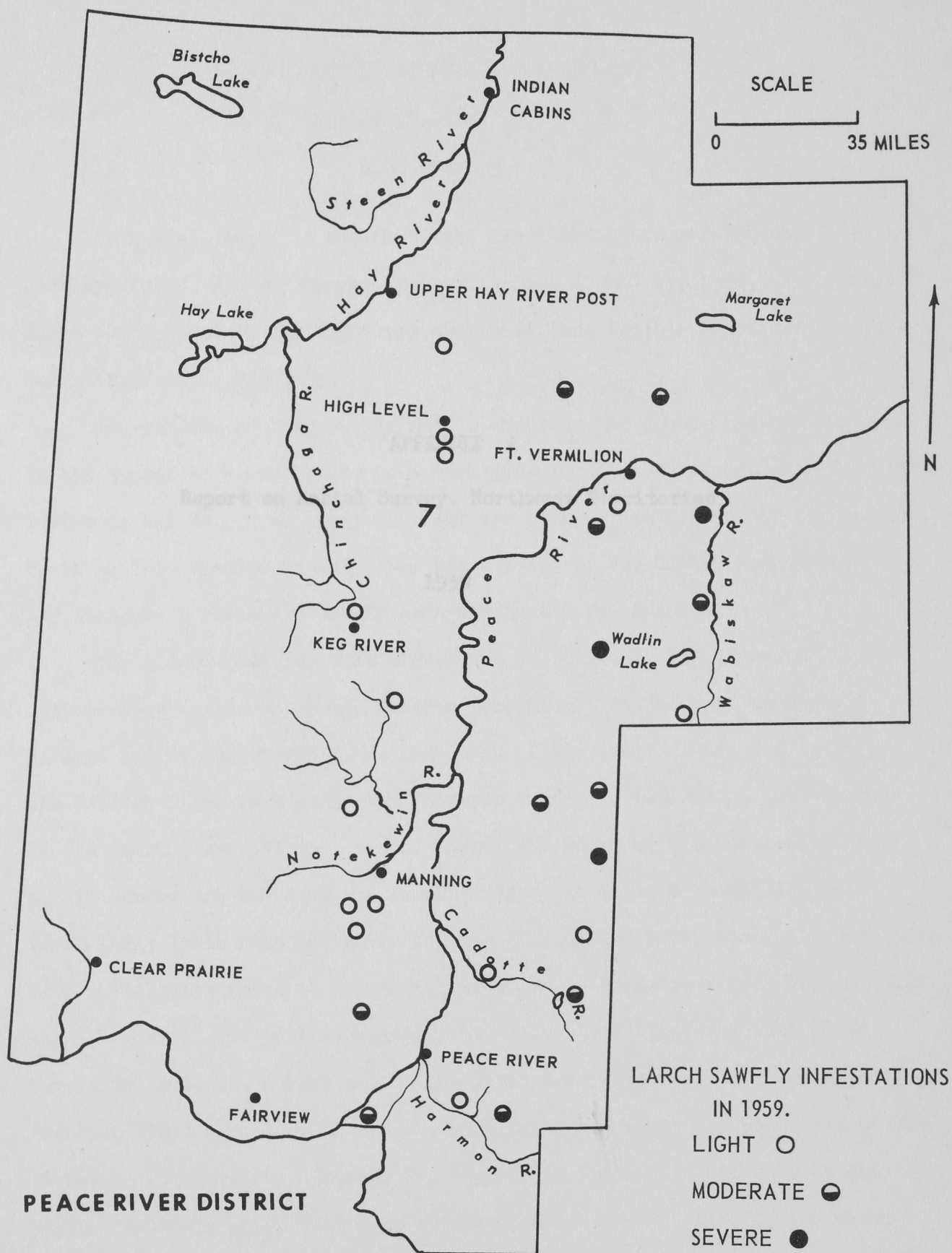
disease.

The affected area lay between the 6th meridian and a line running approximately through Harmon Valley and Ft. Vermilion. It extended from a few miles north of Peace River to within 30 miles of the Northwest Territories Boundary.









APPENDIX A

APPENDIX A

Report on Aerial Survey, Northwest Territories

1959

AERIAL SURVEY, NORTHWEST TERRITORIES

August 15 - 18, 1959.

R.R. Stanley

An aerial survey in the Northwest Territories was carried out by R.R. Stanley, Forest Biology Ranger, between August 15 and 19, 1959. A Cessna 180 float plane based at Hay River was chartered from Pacific Western Airlines and piloted by J. Franklin.

The purpose of this survey was to check on the spruce budworm outbreak in the Mackenzie River basin; to investigate a report of damage caused by this insect in the Ft. Liard area; to check the boundary and intensity of the outbreak of this species on the Slave River north of Ft. Smith; and to record any changes in the larch sawfly outbreak in the Ft. Smith area.

The flight plan for this survey was as follows: Hay River to Ft. Simpson slightly north of the Alberta Escarpment; Ft. Simpson to South Nahanni and Ft. Liard along the east side of the Liard River; Ft. Liard up the Petitot River to the British Columbia boundary, west along the boundary to the Liard River and back to Ft. Liard; Ft. Liard up the Kateneelee River to its headwaters and down the Jackfish River to South Nahanni River at Yohin Lake; Yohin Lake due north to Camsell Bend and north along the west side of the Mackenzie River to Norman Wells; 40 miles downstream from Norman Wells along the east side of the Mackenzie River and back along the west side; Norman Wells to Ft. Norman and up the Great Bear River to Ft. Franklin; Ft. Franklin south past Blackwater Lake to Wrigley and along the east side of the Mackenzie River to Ft. Simpson; Ft. Simpson to Trout Lake and east to Hay River; Hay River to Buffalo Lake and northeast to Long Island in the Slave

River; Long Island to Ft. Smith along the west side of the Slave River; Ft. Smith to Ft. Resolution along the east side of the Slave River; Ft. Resolution to Hay River along the south shore of Great Slave Lake.

This survey took 4 days to complete. During this time approximately 2,600 miles were flown in 22 hours.

Most of the area was covered at about 800 feet above the ground and insect damage was quite easily spotted. In cases where the cone crop on spruce was heavy it was necessary to drop much lower to determine whether there was any defoliation, and in many cases it could only be decided by landing and making ground checks. The cone crop at this time gave the crown of the trees a reddish appearance greatly resembling spruce budworm damage.

INSECT CONDITIONS

Spruce budworm, Choristoneura fumiferana (Clem.)

The outbreak of this insect in the spruce stands along the Mackenzie River from Ft. Simpson to 25 miles north of Norman Wells has subsided noticeably except in the immediate vicinity of Ft. Simpson where there was a definite increase in populations. Damage was also recorded in the moderate category at Camsell Bend and in a fairly large patch approximately 10 miles south of Wrigley. At all other points along the Mackenzie River injury was light.

It is suspected that low populations of spruce budworm were present in all stands from Ft. Simpson along the Liard River to Fort Liard. Light injury was evident for 10 miles up the Liard River from its junction with the Mackenzie River, at a point 20 miles downstream from South Nahanni and also at South Nahanni. Moderate defoliation occurred along the Petitot River for

15 miles from Ft. Liard, along the Liard River from Ft. Liard to within 6 miles of the British Columbia border, and for 18 miles up the Kateneelee River from its junction with the Liard. From this point to the headwaters of the Kateneelee, light defoliation was evident.

The infestation of spruce budworm in the area north of Ft. Smith along the Slave River has increased in intensity and covers a larger area. It now includes all spruce stands from a point approximately 10 miles north of Salt River to 15 miles north of Long Island, a distance of nearly 90 miles. Throughout most of this area defoliation ranged from light to moderate but in the vicinity of Long Island was moderate to heavy.

Larch sawfly, Pristiphora ericksonii (Htg.)

The aerial survey conducted in 1958 in the Northwest Territories revealed heavy defoliation of larch extending 40 miles west and 15 miles north of Ft. Smith. The 1959 aerial survey showed the infested area had increased in size and had spread north to Great Slave Lake and west to Buffalo Lake. Defoliation was heavy throughout this area from Ft. Smith to Great Slave Lake and west to within a few miles of Buffalo Lake. There was little evidence of damage west of Buffalo Lake.

Poplar leaf-miner, Phyllocnistis populiella (Chamb.)

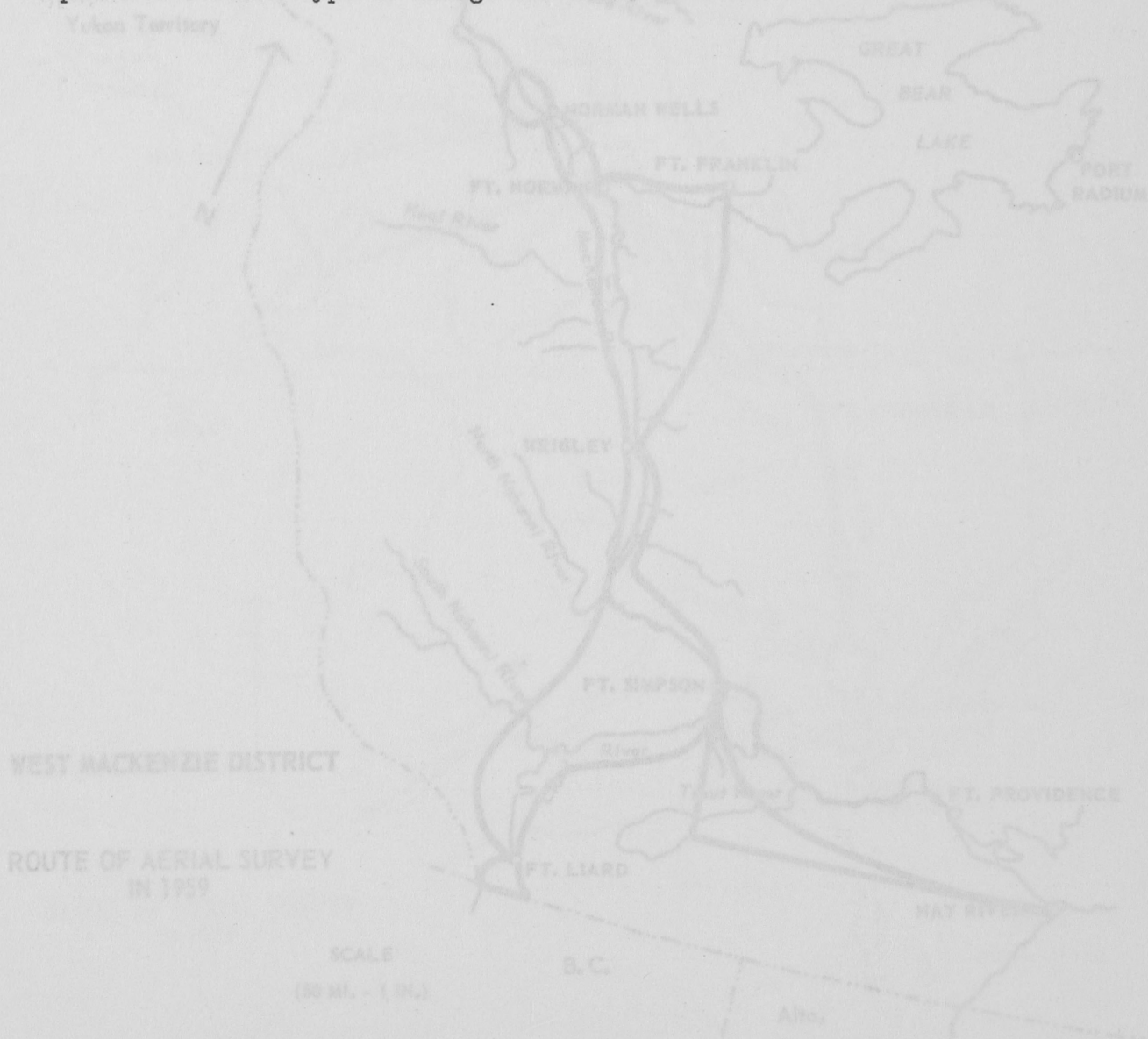
These insects were very heavy on aspen in the Ft. Simpson, South Nahanni and Ft. Liard areas. It was estimated that 90 per cent of the leaves on aspen at Ft. Simpson were affected. Fairly high populations were also noted at Wrigley and Camsell Bend. Warden Frank Bailey at Simpson noted that these leaf-miners were heavy in nearly all aspen stands in the Ft. Simpson District.

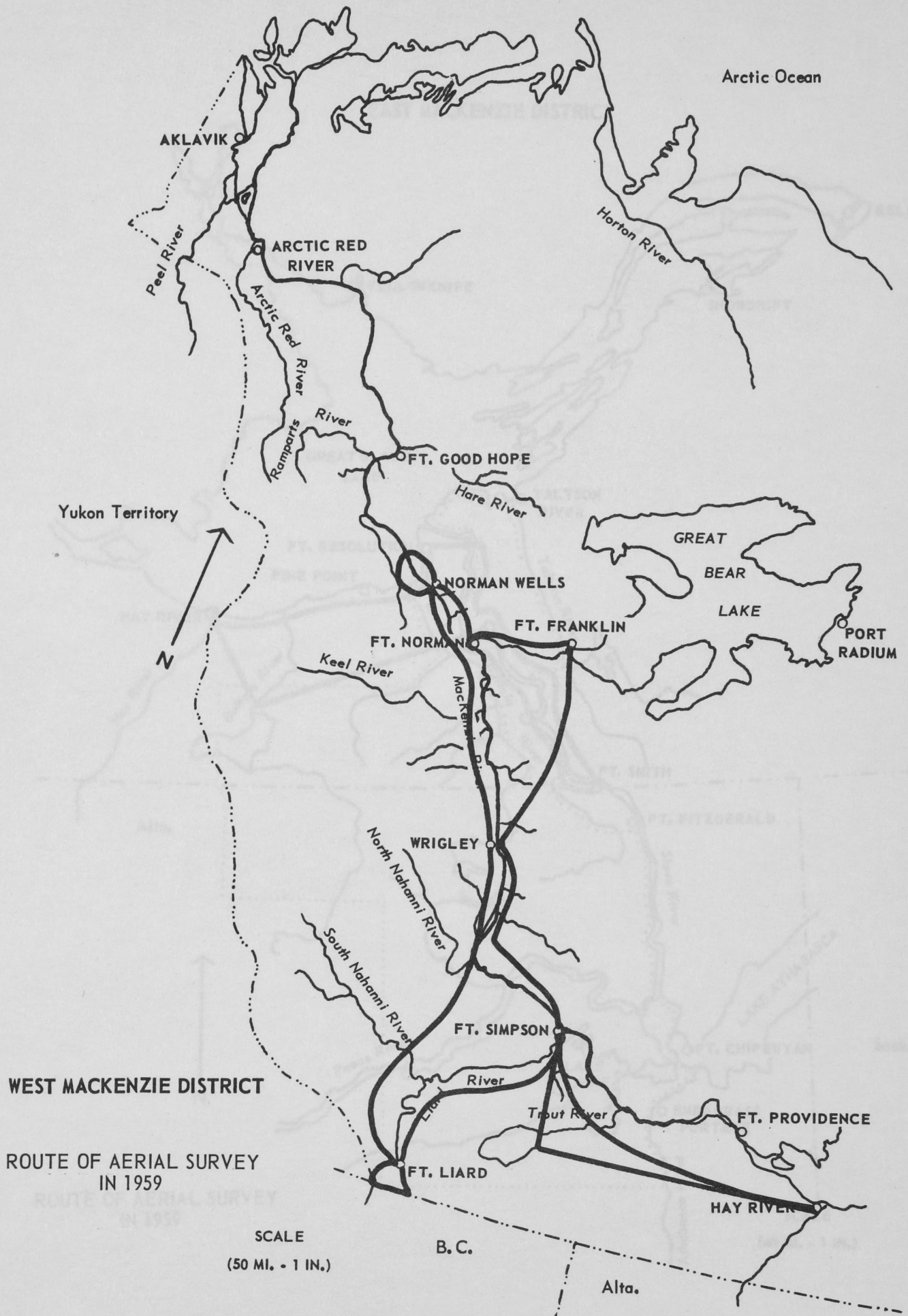
Yellow-headed spruce sawfly, Pikonema alaskensis (Roh.)

Defoliation of white spruce was observed at Wrigley, Bennett Field, Kakisa Lake and Buffalo Lake. In all areas defoliation was very light.

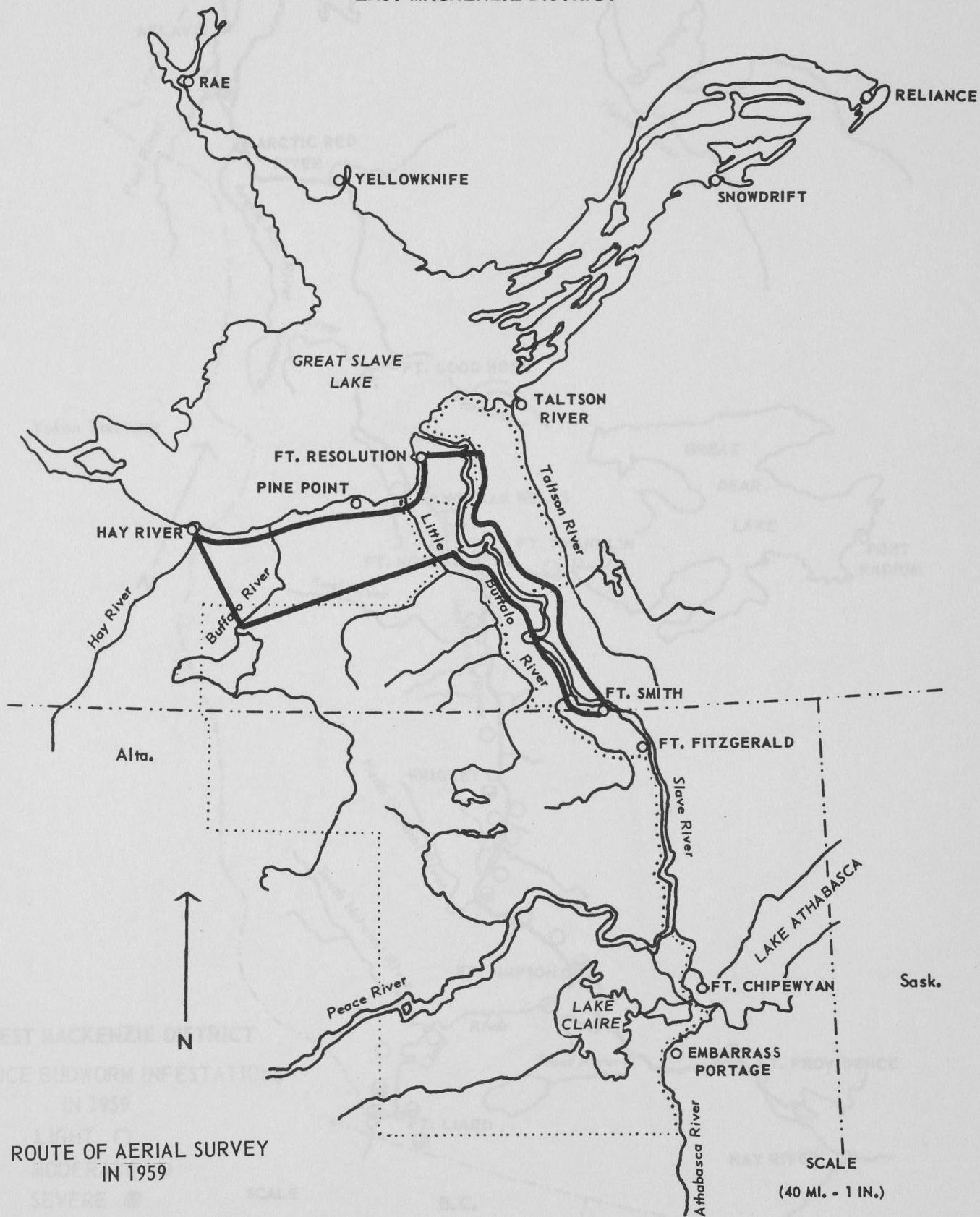
Frost Damage

Pine stands along the mountain sides in the vicinity of Little Doctor Lake were severely affected by frost. The area involved was approximately 4 miles in length and varied from $\frac{1}{4}$ to 1 mile in width. This was the only place where this type of damage was seen.

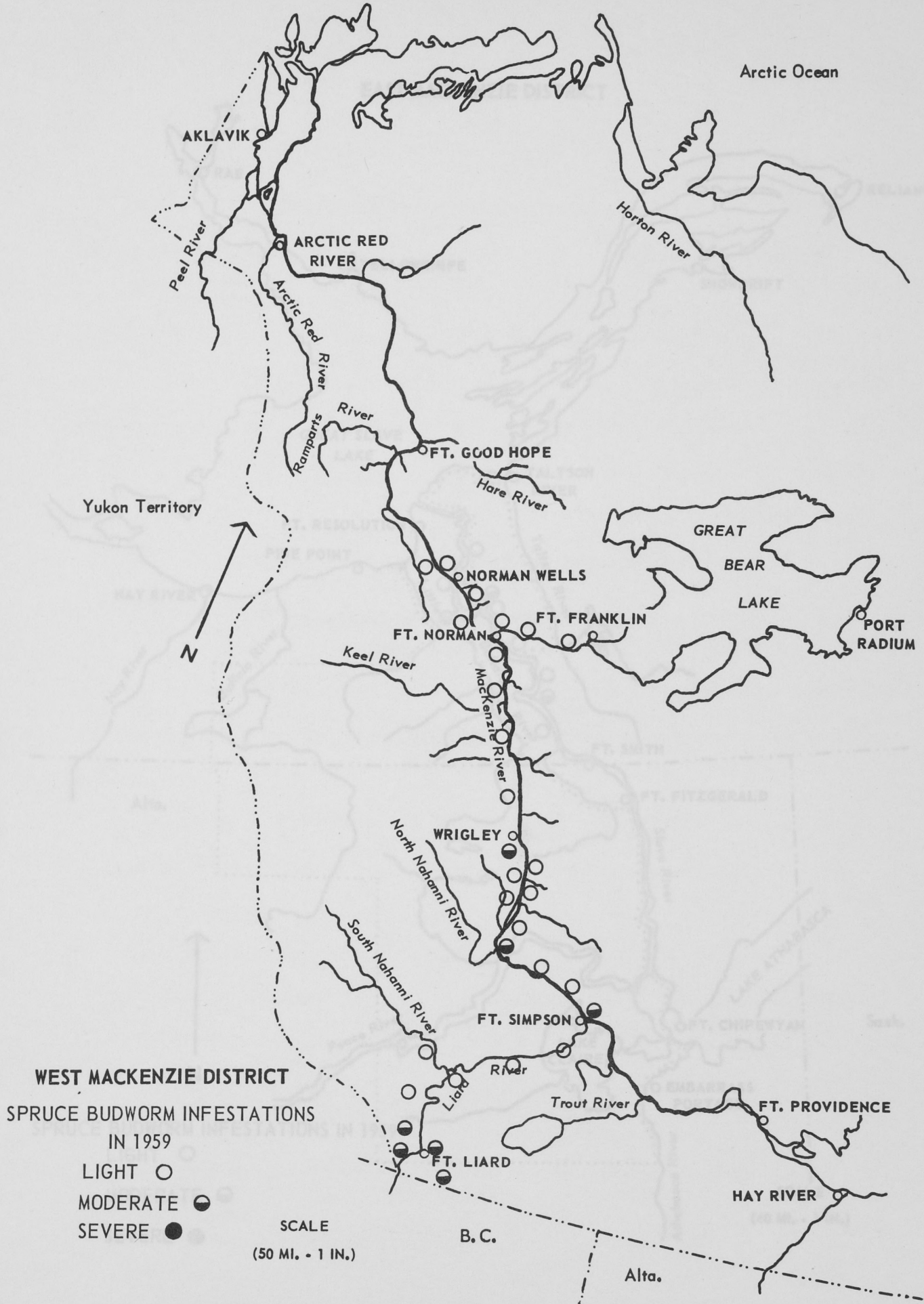




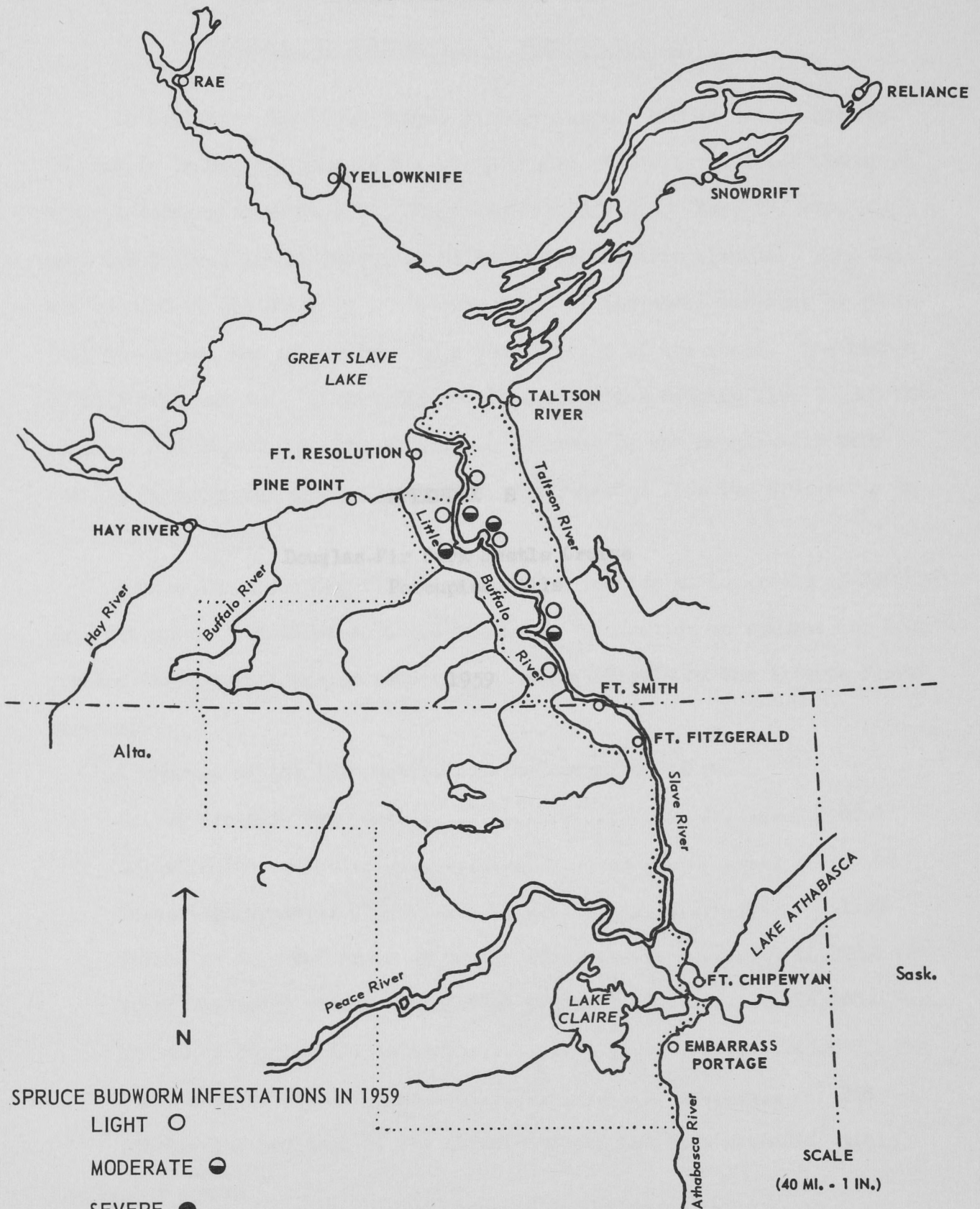
EAST MACKENZIE DISTRICT



ROUTE OF AERIAL SURVEY
IN 1959



EAST MACKENZIE DISTRICT



APPENDIX B

In September 1959, Forest Biology Branch of the Forest Biology Laboratory in Calgary conducted a strip cruise of beetle infested timber on a berth designated as 12-137, Departmental Sale #13, Sec. 27, Twp. 10, Rge. 1-4-1-10, in the Porcupine Hills in south-western Alberta. This area was bounded on the south by a well-wooded area, on the north and west by grass-land and open, and on the east by a continuation of the stand. The timber on this area was made up of 1,245,000 cu. ft. of mature Douglas fir, 20,000 cu. ft. of pine, and 20,000 cu. ft. of spruce. An outbreak of the Douglas-fir bark beetle, *Dendroctonus valens*, was reported from the area early in the summer of 1959.

APPENDIX B

Douglas-Fir Bark Beetle Cruise

Porcupine Hills

Cruise lines running in a north-south direction at intervals of 200 feet were set up and the timber was tallied. Information on volumes for Douglas fir and the original cruise report 1959 made available by the Alberta Forest Service.

A summary of the information obtained is given below.

No. of acres in the berth.....	66.0
No. of acres cruised.....	7.63
Percentage cruised.....	11.5
Volume of infested trees on cruise lines.....	14,320.0 cu. ft.
Total estimated volume of infested trees.....	124,500.0 cu. ft.
Volume of Douglas fir in berth.....	1,245,000.0 cu. ft.
Percentage of total volume.....	10%

Ninety-four per cent of the infested trees had been attacked within the last 5 years.

DOUGLAS-FIR BARK BEETLE - PORCUPINE HILLS

On September 28, 1959, Forest Biology Rangers of the Forest Biology Laboratory in Calgary conducted a strip cruise of beetle infested timber on a berth designated as TA 5137, Departmental Sale #13, Sec. 27, Twp. 10, Rge. 1-W 5 Mer., in the Porcupine Hills in southwestern Alberta. This area was bounded on the south by a cut-over area, on the north and west by grass-land and aspen, and on the east by a continuation of the stand. The timber on this area was made up of 1,245,000 fbm. of mature Douglas fir, 20,000 fbm. of pine, and 20,000 fbm. of spruce. An outbreak of the Douglas-fir bark beetle, Dendroctonus pseudotsugae Hopk. was reported from the area early in the summer of 1959.

Cruise lines running in a north-south direction at intervals of 200 feet were set up and the infested trees tallied. Information on volumes for Douglas fir and the original cruise report were made available by the Alberta Forest Service.

A summary of the information obtained is given below.

No. of acres in the berth.....	66.0
No. of acres cruised.....	7.63
Percentage cruise.....	11.5
Volume of infested trees on cruise lines.....	14,320.0 FBM
Total estimated volume of infested trees.....	124,500.0 FBM.
Volume of Douglas fir in berth.....	1,245,000.0 FBM
Percentage of total volume.....	10%

Ninety-four per cent of the infested trees had been attacked within the last 3 years.

It is recommended that the Douglas fir timber on this area be logged as soon as possible in order to salvage as many of the beetle infested trees as possible. Since this is a mature stand it is likely that the beetles will continue to attack trees and since the annual increment is small, it is likely that the total volume on the stand will decrease rather than increase. Therefore, it is recommended that the area be clear cut.

It is further recommended that the infested areas be logged first and that every effort to prevent the spread of the beetles to adjacent areas be made. All slabs and stumps and tops must be burned in early spring (prior to May 1st) before beetle emergence begins.

J. Petty & C.E. Brown,
Forest Insect Survey,
Forest Biology Laboratory,
102-11th Ave. East,
Calgary, Alberta.
February 1, 1960.

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Spruce budworm, <u>Choristoneura fumiferana</u> (Clem.)	6,16,31
Spruce spider mite, <u>Oligonychus ununguis</u> (Jac.)	24,32,61
Tent caterpillars, <u>Malacosoma lutescens</u> (N. & D.), <u>Malacosoma pluviale</u> (Dyar)	16,52,60,68
Weevils	33
Willow leaf beetles, <u>Galerucella decora</u> (Say), <u>Galerucella carbo</u> (Lec.)	25,32,39,61
Yellow-headed spruce sawfly, <u>Pikonema alaskensis</u> (Roh.)	21,40,50,60,67
OTHER NOTEWORTHY INSECTS	8,18,26,34,43,52,62,69

DISEASE CONDITIONS

<u>Apiosporine collinsii</u> (Schw.) Von Hohnel.	54
<u>Arceuthobium americanum</u> (Nutt. ex Engelm.)	53
<u>Atropellis piniphila</u> (Weir) Lohman and Cash	27, 44, 63
<u>Chrysomyxa ledi</u> (A. & S.) DeBary	54
<u>Chrysomyxa pyrolae</u> (DC.) Rostr.	63
<u>Cronartium commandre</u> Peck.	54
<u>Cronartium harknessii</u> Moore Meinecke	44, 63
<u>Cronartium stalactiforme</u> A. & K.	44
<u>Cytospora chrysosperma</u> (Pers.) Fries.	45
<u>Lophodermium pinastri</u> (Schrad.) Chev.	35
<u>Peridermium coloradense</u> (Diet.) A. & K.	54
<u>Pucciniastrum goeppertianum</u> (Kuhn) Kleb.	45
<u>Rhabdocline pseudotsugae</u> Syd.	35
Red belting	28, 35
<u>Sclerotium confundens</u> Whet.	53
Weather damage to aspen	28, 69
Weather damage to larch	69

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